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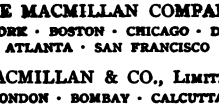

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THE TEXTBOOK

HOW TO USE AND JUDGE IT

BY

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TO THE MEMORY

OF MY SISTER

HORTENSE

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PREFACE

In presenting this discussion on the Textbook to the school public I confess to a considerable amount of fear and trembling, not unlike that of the pioneer who penetrates the dark unknown wilderness, or of him who manipulates his acids and compounds in the search for some chemical truth. I have sought in vain for any treatment of this subject in book form. After wrestling with the problem for many months I have grounds to suspect the reasons for no earlier attempt having been made to organize the various aspects of this subject into some sort of unified study.

I shall anticipate the critic's attack by saying that I know, perhaps better than he, the limitations of my effort. My real purpose in offering the book to school administrators and teachers is to arouse, if possible, someone among them to construct a volume on the textbook that will be more adequate than my own attempt. Graduate students will find many fascinating problems in this field. Every teacher who shares the responsibility of selecting texts must feel the thrill of exploration in this almost untouched department of instruction. There are, to be sure, many studies on the textbook being made by committees assigned the difficult task of recommending suitable school books in the various subjects; but many of these lie undiscovered in the offices of school superintendents, and have not been made available beyond the school system immediately concerned in their use.

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In this book I have sought to analyze as simply and comprehensively as possible the reasons for the prominence of the textbook in American education. The history of the textbook is one of those uncultivated fields of research that awaits the magic touch of deep scholarship. Administrative considerations of the textbook are so closely allied with some of the most delicate situations in the management of public education, that I have found it difficult to do justice to some of the moot questions involved in this aspect of the subject. The experienced school official will be able to read more between the lines than in the type itself. The textbook as a tool, as a source of knowledge, as an interpretation of truth, as a guide, and as a means of inspiring in the pupil a will to learn links up very closely with my view of education as a means of training the pupil to study. I do not minimize any of the great movements that now occupy the attention of educational leaders. The problems of education are so immense and so numerous that they must be viewed from several angles. One of these points of view is supervised study or the provision in each class period for a certain amount of training in how to study. Skill in handling the textbook is just as important as skill in handling the tools in manual training or household arts. It is not the only tool for the mastery of the abstract subjects. There are others equally important, but in this volume I have confined my efforts to the textbook.

It is with the hope that school administrators and teachers will find in the following pages some few suggestions pointing the way to a larger study of this whole subject that I venture to offer these pages for their perusal and criticism. The material grows out of a course of lectures that I had the privilege of delivering before the Teachers Association of Rochester,

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New York. What I then said regarding the textbook seemed to meet with a response so cordial that I have thought other teachers might find in such a discussion points of contact with problems of their own.

I am greatly indebted to my colleagues, Miss Frances Jenkins and Dr. Cyrus D. Mead, for permission to use some of the material that they helped to evolve. The members of my Seminar on Secondary Education have rendered willing and efficient service, and to them I express sincere acknowledgments. To Dean W. P. Burris of College for Teachers of University of Cincinnati, I am grateful for a critical reading of most of the manuscript. For whatever there may be in the volume that has merit I am indebted to the many whose names are scattered throughout the pages that follow. The sins of commission and omission are my own.

A. L. H.

University of Cincinnati,
January 4, 1918.

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THE TEXTBOOK

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TEXTBOOK, HOW TO USE IT AND JUDGE IT

CHAPTER I

THE TEXTBOOK — ITS PLACE IN MODERN EDUCATION

The Textbook as a Problem for Investigation. In these days when every part of the school system is undergoing supervision and criticism, and when reorganization is the cry of the hour, there is great need of a thoroughgoing examination into the intricate problem of the textbook. It is in the textbook that one expects to find the essentials of a subject, the general outline of a course. The teacher and the textbook are the two pillars of instruction. Each without the other is inadequate, as a rule. Educators and school administrators have begun to ask serious questions of textbook makers, for the maker of textbooks is one of the most influential forces in the shaping of educational policy. The need has been felt of late for courses on textbook making, to be given in schools of education. So far as the writer knows there is no course of this kind offered in any of our colleges or universities.

A suggested course on the textbook. Such a course on the textbook might embrace the following topics: The History of Textbooks; Current Scope of Subject-Matter in Textbooks; Organization of Textbook Material from the Standpoint of Child

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and of Adolescent Psychology; Arrangement of Material with Directions for the Proper Studying of It; How to Frame Questions in Textbooks and to Select Problems of Application; Methods of Gathering Material for the Textbook; How to Prepare the Manuscript for the Publisher; Methods of Publication; Compensation of authors; Revisions; Collecting Reviews; Standards for Judging Textbooks. Running through the course would be repeated references to the Psychology and the Pedagogy of Reading.

With the growth of the need of textbooks, their variety, their frequent revisions, and the consequent extension of the publishing business with its plans of marketing and of seeking adoptions, many difficult problems have arisen. Various schemes of publication are being tried. The methods of textbook distribution are being carefully considered. So large is the place occupied by the textbook in American education that wise counsel and dispassionate investigation are imperative if results for the best progress in the schools are to be expected.

Why Is the Textbook So Prominent? Among the questions that must be considered is the reason for the prevailing prominence of the textbook in the public schools of America. Some writers on this subject believe that if there were a larger percentage of highly trained teachers in the American school there would be correspondingly much less need of the school book. This seems to imply that in the hands of the many inadequately trained teachers the textbook becomes a mere crutch or a model. The teacher depends on the book; its organization and its contents are followed in minute detail. No one who understands school conditions will deny the truth of this criticism. It would be unfair, however, to assign the chief reason to the large number of insufficiently trained

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teachers. Doubtless the best teacher in the public school profits by the use of a text. In fact, without a good textbook the course would be much more laborious and much less effective. Furthermore, much of the difficulty in entrance requirements lies in the lack of organization of the new courses. The most liberal friends of modern school subjects will admit that many of these courses are still so indefinite in scope and sequence of material that, for administrative purposes, it is very difficult to adjust them to needful order and system in even a flexible scheme of entrance requirements.

President Thwing calls the textbook a teacher of teachers. By means of a text or several texts the teacher introduces the pupil to a world of knowledge he little suspected. It is through the windows of the textbook that teacher and pupil glimpse the immensities of truth, stretching as far as intellect and dreams can penetrate. Not that this is the only outlook, but it is indispensable, at least in American education. A few years ago an English writer made the following observation:[1]

> The method of actual teaching in American schools differs much from that in use in England. It centers in the textbook. Nothing strikes an English teacher more forcibly on first listening to lessons in American schools than the important place the textbook takes. . . . The success of the method is aided in America by several conditions, as yet rare in England. First, the textbooks are much better than ours. . . . Often a teacher in England cannot make her pupils depend upon themselves for getting up a subject, because the only textbook that can be afforded is meager or even obsolete; and she is the only person who has access to a really good book.

[1] Quoted from Chas. H. Thurber on "What about Textbooks?" *Outlook*, Sept. 13, 1913.

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The Inadequacy of the Textbook. It is now being advocated by many educators that teachers should break away from slavish dependence upon the textbook, and should plan courses that include much supplementary material and many books. All of us, doubtless, would agree that it is no longer advisable to use only one book as a text or to follow this one blindly. But it would be equally unpedagogical to abandon this aid entirely in all courses. Here as elsewhere moderation and rational selection are most important. It is well, however, to bear in mind the criticism formulated by Charles McMurry.[1]

1. The textbook cannot give adequate treatment of important topics.
2. It cannot easily set up problems and give fit suggestions to their progressive, independent working out.
3. The reflective tracing out of relations in which a central topic stands to other topics, gained through causal connection, comparisons based on likeness and contrast, and other forms of association — this considerate balancing up and organizing of thought material can be done very inadequately in a textbook treatment.

These defects, however, are not necessarily inherent in the nature of textbooks. They doubtless exist but they need not continue to do so. If by "adequate treatment of important topics" is meant adequate for the pupil at any particular stage of educational development, then this defect could be removed by a careful evaluation of material based on a sound doctrine of educational values. If by "adequate" is meant a large, comprehensive treatment, then we find this possible through

[1] *Conflicting Principles of Teaching*, Houghton Mifflin Co., 1914, p. 86.

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the author's additional reference material and suggestions for study. Even if it were possible to have a comprehensive and well-unified discussion of any one topic, it may be questioned if this would be wise. Beyond a consideration of certain fundamentals, the textbook should be mainly suggestive.

The second objection has already been met in many of the most recent textbooks. Their problems and suggestions for independent study are much better than could be devised by many teachers. But, granting the validity of Dr. McMurry's objection, it may still be doubted if the textbook should be exhaustive in these problems and directions. Necessarily, they are given in limited number, but this need not be regarded as a defect. One must still expect the teacher to apply educational material to local needs and local conditions, and to adapt source-material to educational ends.

The third objection is most searching. No textbook can perform the processes of thinking. But under the direction of a teacher who knows the psychology of study it is possible to find causal connections, to make comparisons and contrasts, and in general to carry on the process of organization. This is the teacher's task. To some extent it is also the author's, and among textbook makers one finds not a few who attempt this service.

Why Textbooks Exist. Several reasons may be assigned for the large place occupied by the textbook in American education.

1. The textbook holds a central place in school work because it offers *a compact arrangement of educational material.* If one seeks the meaning of physics, a glance through a number of textbooks gives one the scope of this subject. All of us resort to such compendiums of knowledge for educational

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purposes. The textbook expresses (in varying degrees of adequacy to be sure) the prevailing conceptions of the respective subjects in the program of study, and in this way makes it possible to formulate a scheme of training that will more satisfactorily relate to the pupils the ends of education, as these ends are determined for the several school levels.

The text, by the amount of space given to various topics, shows in general the relative values of different parts of the subject. There is, of course, wide divergence of viewpoint in this matter, and the author's apportionment of space may not be a true indication of the essential values in the subject. The author's selection of material does exercise, however, a very direct influence on the course. He puts, as it were, a stamp on the scope and quality and accuracy of the subject. From him the pupil obtains perhaps the only conception of the subject he will ever be able to get or to use. For this reason a textbook must be very carefully examined lest its bias prove seriously unfair to the pupil's comprehension of the course.

2. Not only is the textbook a compendium of knowledge for school purposes, but it serves also the valuable end of *ready reference* after the individual has completed his formal education. No one is able to retain all the details of his various courses of study. It would probably be undesirable, even if it were possible, to carry through life a large number of principles or facts for which one might have only occasional need. But after the pupil has completed the study of fundamental material, as suggested in the textbook, he can refer to the textbook in later years and thereby refresh his memory on needed points. Many of the rules in mathematics, for example, are easily forgotten by persons who have had no

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need of their frequent application. The emergency call can be answered by consulting the textbook. After all, education is mainly a means of supplying ideas and a knowledge of sources. Only the facts which become habits by use in our callings remain in our close possession. The rest of our educational experience is available by our knowing the depositories of desired data.

3. Another reason for the universality of the textbook lies in its *provision for a uniform education throughout the country.* However ardent supporters we may be of individual education, it must be agreed that a degree of uniformity is equally essential. There must be a concept of arithmetic common to California and New York. Grammatical usage must be fairly uniform in a democratic education. Every subject must connote and to some extent denote the same thing all over our country if citizens are to understand one another, and to coöperate in democracy's business. By means of the textbook the general meanings of subject-matter are spread from coast to coast.

4. A fourth reason for the widespread use of the textbook lies in its provision for *an orderly pursuit of the course.* It gives teacher and pupil a tangible link that unites the many details of the subject. This, of course, is possible without the aid of a book, but it is doubtful if an exclusive lecture or collateral reading method would be advisable in high school work, not to say in the elementary school. There is a growing opinion that the lecture method is not the best even in college. The author's arrangement of material in the textbook is his conception of the course, but frequently he will suggest a possible procedure in the sequence of chapters different from the order he has used. In the book the teacher finds large

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units of instruction (main divisions, such as the Civil War or Fractions) and smaller divisions (sections or chapters) which serve as bases for assignments. In whatever way the teacher may reorganize the book for teaching purposes, its treatment of the course does greatly aid in unifying the work and in making possible the division of education into various teaching units.

5. The textbook in many instances is *a definite help to correct studying*. This is true, especially, of more recent texts. By means of syllabi, summaries, emphasized points for study, outlines for reference reading, and many titles of reference books, as well as by questions for review and original work, the author seeks to make the pupil aware of a certain amount of technic in the learning of a subject. The importance of this sort of textbook making in the development of study outside of school cannot be overestimated. The pupil needs a certain amount of direction if his studying is to be pursued economically and effectively. The "study-helps" are not crutches but guide posts.

6. The best kind of textbook, one written by a wide-awake author who appreciates the life-value of his subject, not only gives direction for study but it *supplies directions for the application of the subject*. To many teachers this is an invaluable help. Under proper direction the practical problems stated in the textbook become invaluable also to the pupil. It probably is true that the time saved for teachers and pupils, the rich suggestiveness and the basis they supply for testing progress, make the problems and directions for further study indispensable. Without them the schoolbook would be of comparatively little service in any public school course; and many texts have failed to become popular or

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serviceable very largely because they lacked the needful suggestions and specific guidance in applying the subject to vital needs, or in leading the pupil to more independent and thoughtful study of the subject.

7. Of less value to the teacher and pupil but significant for students of the history of education is *the record of subject development* provided by textbooks from year to year. A study of textbooks in grammar and in history, for example, shows how greatly the point of view regarding this subject has changed. A series of texts in any one subject records the progress of thinking in a particular field. Without textbooks it would be difficult, if indeed at all possible, to trace the historical growth of educational material. The textbook, like the school itself, reflects the age in which it was evolved. Our texts to-day are in many instances a vast improvement over those of a decade ago. It may safely be predicted that like improvement will take place within the next ten years. Having the old and the latest texts, there is the fascinating possibility of studying the growth of racial and national points of view, and the constantly readjusted needs of society for the subjects in the school.

8. Still another benefit to be derived from the textbook is *the possibility of determining administratively the various levels of school systems and the progress of pupils* among these several systems by means of knowing exactly how much ground has been covered by the pupil. This record is also important in transfers from school to school. Transferred credits are based partly on the amount and quality of work done in certain textbooks. If these textbooks are not the same as those used elsewhere, it becomes necessary to make careful comparisons. Without such books it would be difficult also to accredit

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schools. As it now is, college entrants are accepted on the ground of a well-known prescribed kind of preparation, and the college work continues what has been done in the secondary school. This, of course, does not insure adequate preparation, for quantity of work (as represented in units) does not mean thoroughness, but the prescribed courses with recognized textbooks and other educational equipment provide a scheme of determining intellectual preparedness.

The advantages of the textbook have been well stated by Dr. W. T. Harris:[1]

> It has the advantage of making one independent of his teacher; you can take your book wherever you please. You cannot do that with a great lecturer, neither can you question him as you can the book, nor can you select the time for hearing the great teacher talk as you can for reading the book. And it is true that nearly all the great teachers have embodied their ideas in books. The greatest danger of textbook education is verbatim, parrot-like recitation, but even here, from the poorest textbook, a great deal of knowledge can be gleaned. Then there is the alertness which in any large class will necessarily be engendered by an intelligent understanding and criticism of the results arrived at by different pupils in discussing a certain piece of work given in their own words. And then there is the advantage to be found in the fact that with the textbook the child can be busy by itself.

A cursory glance over the situation in the United States assures one that the textbook is a remarkable factor in public school education, and nowhere so wonderfully developed as here. The American publishers are among the great educators

[1] Lectures on the Philosophy of Education, Johns Hopkins University Studies in Historical and Political Sciences. Supplementary notes. Eleventh series, 1893, p. 272.

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of the world. They are constantly on the lookout for new ideas in the classroom, and wherever they discover a teacher who is doing something of merit they enlist this teacher to prepare a description of method or of an organization of a course so that it will be available to all other educators. Publishers and teachers, with the help of expert book critics and technicians of book making, become in this way the *sine qua non* of public education. Without this means of organizing and preserving the newest ideas in education many blessings of genius and trained intellect would be unavailable for coming generations.

Summary. The foregoing advantages in using the textbook indicate that not without reason has this field of public education reached its astonishing development. At present authors and publishers are seeking to incorporate what investigators have found to be essential principles in effective learning. While it is true that teachers are greatly supplementing the textbook by a large variety of materials and technic, it is equally true that their need of the book as part of their directive material has increased, for the books of merit to-day are numerous, and no one book can easily be selected for exclusive reference in a course.

In the following pages an attempt is made to consider very briefly some of the principles that seem important in the discriminating use of the textbook. To the reflective teacher the discussion may suggest other ways in which texts can serve pupils and teachers. The alert instructor will employ procedures peculiarly adapted to his own groups of pupils. Some teachers will find it necessary to give greater attention to the substance of the book, while others may need to refer to the text as only one of many reference books. No one

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scheme of reorganization of textbook matter can be applied to all subjects or to any one subject. Here again the teacher's initiative and originality must be drawn upon. While we are waiting for the ideal book teachers can render valuable service by making the study of textbook construction part of their discussions at institutes and in reading circles; and also the field of careful experimentation for the ascertaining of what arrangement of material will best serve the needs of school people engaged in the teaching and studying of the various subjects.

QUESTIONS AND PROBLEMS

1. Do you notice in your school that there is any tendency to depend less heavily on the textbook than formerly?
2. If there is such a tendency what are the reasons for it? Are these reasons sound?
3. If you were planning a course on Textbook Making what topics would you include?
4. In addition to the advantages of the textbook already named in the chapter, what others, growing out of your own experience, can you suggest?
5. What additional disadvantages of the textbook have you found?
6. What conditions in American education seem to require a greater use of textbooks than in European countries?
7. Which type of school system do you judge is the stronger — one using many texts in a course, or one using only one? Why?
8. Did the ancient Greeks and Romans use many textbooks?
9. How would you organize and administer a school system that used texts only occasionally?
10. Have you referred to many of your old school books since graduation? Why?

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11. Among the advantages of the textbook which do you regard most important? Why?

12. Which of the disadvantages of the textbook seem to you most serious? Why?

REFERENCES

HARRIS, W. T. *Importance of the Textbook.* Journal of Education, Vol. 80: 317; Oct. 8, 1914.

HART, A. B. *Schoolbooks and International Prejudices,* American Association for International Conciliation, 1911.

RICE, J. M. *Substitution of the Teacher for the Textbook,* N. E. A. Proceedings, 1895. pp. 562–70.

THURBER, C. H. *What about Textbooks?* Outlook. Vol. 105: 81–4; Sept. 13, 1913.

WINSHIP, A. E. *Vitality and Virility of American Schoolbooks.* Journal of Education, Vol. 82: 255–8; Sept. 23, 1915.

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CHAPTER II

A BRIEF HISTORY OF THE TEXTBOOK

The Need of a History of the Textbook. Within recent years many histories of education have been written from various points of view and with widely differing types of organization. One meets with disappointment, however, in the search for a history of the textbook. There are many and scattering references to schoolbooks throughout the history of the development of educational systems and institutions. By inference one is satisfied that in the educational schemes of ancient Babylon, Assyria, Egypt, and Israel there were no individual texts available. The clay tablets of ancient Persia, small and numerous, may have served as convenient media of instruction, just as they were used for correspondence, military and commercial orders, receipts, etc. The papyrus rolls among the Egyptians were carefully guarded by the priests. In Greece and Rome it is unlikely that each pupil possessed a textbook of his own. The expense and the time required to copy manuscripts would make their wider distribution prohibitive.

Mediæval Textbooks. Toward the end of the twelfth century individual manuscripts were not uncommon. Many small sized Bibles and prayer books were current. Manuscripts with copious notations are now found in such museums as the Vatican, and those in Lisbon, in Paris, and in the ar-

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chives of many of the old monasteries. They witness to their having been used by students under some form of instruction. The ancient classics were used as foundational subject-matter, and there were, of course, numerous manuscripts of these ancient writings. Reference books in the form of theological and philosophical commentaries were also available. Condensations of Aristotle's lectures were also used. Grammars as compendiums of definitions, classifications, and purely formal rules of speech were studied. Arithmetic and geometry and astronomy formed part of the seven liberal arts.

The most popular books in mediæval education were the following:

Orosius, Historiarum adversus Paganos, Libri VII.

Martianus Capella Nuptiae Mercuri et Philologiae. (*Marriage of Mercury and Philology.*)

Donatus ars Grammatica.

Boetius, Consolatio Philosophiae.

Casiodorus, De Arte et disciplina liberalium artium.

Isodorus, Etymologiae.

They were cumbersome depositories of Greek and Latin treatises. Museums of knowledge would be an accurate description of them. The contents had to be memorized. It should be remembered, however, that, although these books were extremely formal, Latin was the common means of communication among the people, especially in the church. The illustrations, concrete material, and inspiration to study were easily found in the everyday life of the students. The students lived in an atmosphere of Latin, a fact that may easily excuse the absence of vitalizing principles in the books themselves. To-day it is necessary to supply the textbook in Latin as well as in other subjects with vitalizing principles because the

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pupil does not seem to appreciate the fact that some of the school subjects are really very closely concerned with his daily living.

Dr. Frank W. Smith [1] gives an interesting series of summaries of some of the mediæval texts. Capella, for instance, presents the Seven Liberal Arts in a very fanciful manner. They are bridesmaids at the marriage of Mercury and Philology. Each in turn comes forward to present her art in due form and style. The genius of grammar is introduced in the following manner, which is typical of the others:

Letos' son now brings in one of Mercury's attendants, old, but comely, once claiming descent from Osiris and birth at Memphis, long guarded in secret, but found and educated by Mercury. In Attica where she has lived most of her life, she wore the pallium, but enters the assembly of the gods now in Latin fashion, because of Latin environment and Latin auspices.

She plays the rôle of doctor of language and carries strange concoctions of leech-craft for curing various defects of the vocal organs and faults of speech. Among the tools is a highly polished file with eight gilded sides (the traditional eight parts of speech). Capella says: As often as she received any one to be cured it was her custom to treat first of the Noun, the common errors and gender, then modes, tenses, and inflections of verbs. To cure the dull and slow she had them run the whole round labor hard at the whole art.

The dramatic style of the book perhaps was intentionally selected so as to arouse interest.

The Renaissance Textbooks. The textbooks of the Renaissance were in many respects similar to those of the

[1] *The High School.* Sturgis, Walton Co.; 1916.

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preceding age. But at this time many new books began to appear. The printing press made it possible to produce books more quickly and in larger quantities. Men like Sturm and Melancthon began to prepare suitable texts. They edited the classical authors, and Melancthon even wrote a physics as well as texts in other subjects. Books on chemistry, natural philosophy, natural history, geometry, geography, history, etc., now appeared, some in Latin, some in English. By the year 1700 they had reached large numbers.

In the *Constitutions Respecting Instructions of the Society of Jesus* (1558), Loyola refers to textbooks in colleges and universities, but his directions are of interest to the student of this subject in all of its branches. He says: "as touching Latin and Greek books of humanity both in our Universities and Colleges, as far as possible, those shall not be used which contain anything prejudicial to good morals, except they have been previously purified of improper things or words." These directions carry out the spirit of Plato's and Aristotle's instructions regarding the reading of literature.[1]

Melancthon's textbooks deserve more than passing notice. He was not very well satisfied with his *Greek Grammar*, but at the insistence of his "bookseller" he "critically revised the whole altering and improving it." The *Grammar* is simple and clear, but does not include syntax. His Latin grammar was written originally for one of his pupils. It was published in 1525 against Melancthon's wishes. In the edition of 1542 he writes: "In the first edition of my grammar there were various omissions. These may be supplied, yet there should not be too many rules; lest their number prove dis-

[1] For a good discussion of this whole subject see *German Teachers and Educators* by Barnard. Brown and Gross, Publishers; 1878.

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couraging to the learner." He claims that knowledge of grammar is indispensable to the understanding of theology. He says further in the second part of the edition of 1550 of this grammar or syntax, that persons who expect to become philologists merely through the perusal of the classics cannot hope to succeed. They will never be rooted and grounded. " Their false view proceeds from a repugnance to the restraint of rules, — a repugnance that by and by will degenerate into a dangerous contempt of all law and order."

The following comment by Schenck, who lectured on Latin grammar at Leipzic, bears witness to possibilities in textbook making that must be now a lost art, for surely no one would have the temerity to-day to review a book in Schenck's abandon of opinion. " This little book," he says of Melancthon's grammar, " has now attained to that perfection that there appears to be nothing deficient in it, nor can there hereafter be anything added to it; and accordingly it will ever continue to be, as it now is, the sum of all perfection, neither to be altered nor remodeled." [1]

Michael Neander found, however, that the book was too profuse for elementary instruction. He accordingly reduced Camerarius' edition of Melancthon's grammar from five hundred seven pages to one hundred thirty. This textbook held chief place in the schools of Germany in the last half of the 16th century. Between 1525 and 1727 it passed through fifty-one editions, each more or less altered from the original. The book had large influence on grammatical instruction in Germany even up to the date of Barnard's volume (1878).

Melancthon wrote also *The Manual of Logic*, designed to

[1] Barnard, *op. cit.*, p. 173.

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aid the student to understand Aristotle. He believed that logic was fundamental to the comprehension of the church doctrines, and proclaimed that " even as there are many men of unbridled passions who hate the restraints of moral law, so there are those who cannot abide the rules of art." He produced also a *Manual of Rhetoric*, which was intended as an elementary guide to the study of Cicero and Quintilian. His *Manual of Physics* was written in a pious style, and bears witness not only to much sound learning, but to belief in the superstitions of astrology. As early as 1529 he wrote a *Manual of Ethics* and a *Manual of History*, the latter first written by one of his pupils but entirely rewritten by Melancthon in 1538.

The interest in classical literature, restrained during the long theological domination of individual taste, and revived by the Renaissance, flourished unhindered for a time. But love of the classical ideals of living and thinking soon changed to a slavish worship of classical form, and the resulting Ciceronianism became as formal as any of the disciplines of the schoolmen. Language became a tyrannical drill. Content meant little, form was supreme. The spread of the study of the vernacular gradually resulted in the decline of Latin as a spoken language. This in turn led to the need of vitalizing grammar lest its traditional formalism prove too forbidding for a successful competition with the vernacular. The result was that abbreviated and simplified forms of the old grammars were written. They sought to be more interesting. Among these new texts appeared one that may be called a transition text, for it marks the first definite approach to the modern grammar. This was Robertson's edition of Lily, written entirely in Latin.

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The *Orbis Pictus* by Comenius appeared in 1685. It was destined to become the most popular textbook in Europe for a hundred years. Aside from the A B C primers this was the first illustrated schoolbook ever printed. It was, however, little more than an illustrated dictionary, its style not being markedly attractive.

Textbooks in Colonial America. Among the interesting exhibits at the Panama-Pacific Exposition in San Francisco was a collection of old textbooks which, like old flags and swords and other relics of the battlefield, bore the marks of ancient struggle, much of it, no doubt, physical rather than intellectual. Between the textbooks of our American ancestors (not to speak in detail of the earlier specimens in Europe) and the beautifully bound and handsomely illustrated modern schoolbook, lies a long history whose many pages would prove an interesting and suggestive record of how textbooks began, and how they have been evolved and vastly improved. Strictly speaking, the modern textbook is little more than three hundred years old. Only within the last seventy-five years has it become more adequately adapted to the laws of the learning process, and in several respects there are needs of a still better adaptation.

Happily we have passed beyond the alphabet age, but in the early days learning the alphabet was the beginning of wisdom. Attempts at grading were purely arbitrary, letters preceding simple syllables and these in turn being followed by more difficult syllabification. The road to learning was cobbled with small and large letter combinations. The application of this preliminary instruction was made in the reading of religious material, some of it extremely lugubrious.

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For the convenience of the pupil, and doubtless also for reasons of economy, the earliest reading books were simply a single sheet attached to a small rectangular piece of wood with a handle. The modern handmirror illustrates the general form. Over the sheet was fastened a fairly transparent piece of horn. This "hornbook," as it was called, was suspended around the pupil's neck. To us the contents of this primitive textbook were very crude. The page began with a cross, the emblem of piety, and also a charm against hidden evils in the letters to follow. Then came four rows of the alphabet, two in small letters, and two in capitals. These were followed with three lines of syllables in two columns, at the top of each column appearing the vowels a, e, i, o, u. The left-hand column gave syllables like ab, eb, ib, etc., and the right-hand column, ba, be, bi, etc. In solemn blessing followed: In the Name of the Father, and of the Son, and of the Holy Ghost;" and the Lord's Prayer. The first of these hornbooks was printed in Latin about 1400. In the reign of Charles II they were bound in leather with a picture of the mounted King stamped on the back.[1]

After completing the hornbook the pupil began to study the Primer, also religious. In fact all the books used for instruction in reading were religious up to 1750. These primers were usually copies of sectarian creeds and prayers. Martin Luther, for example, wrote a *Child's Little Primer* which contained the Lord's Prayer, the Ten Commandments, the Creed, and a Catechism. Of special interest to the student of

[1] Interesting pictures of the hornbook and other early texts can be seen in *The History of Modern Elementary Education*, pp. 69–98, by S. C. Parker. Ginn and Co., 1912, and *Old-time Schools and School Books by* Clifton Johnson. Macmillan Co., 1917.

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American education is the *New England Primer*, which was patterned after English models, the latter no doubt being directly influenced by Luther's. It doubtless was influenced also by the *Orbis Pictus* of Comenius (1658). The *New England Primer* appeared in 1690, its author being Benjamin Harris, an English bookseller. It was of small size, about three inches by four, and printed in hand-cut type with very irregular alignment. On the left of the page appear a column of indistinct illustrations and opposite them brief moralizings:

In Adam's Fall
We sinned all

Thy Life to mend
This Book attend

The idle Fool
Is whipt at School

The first part of the *Primer* contains religious admonitions followed by the alphabet and syllables and lists of words for spelling. The letters are arranged in groups of one, two, three, four, five, and six syllables. Then appears the picture alphabet with rimes, as quoted above. Verses for children with references to death, hell, and God's wrath come next. There are quotations from the Proverbs, The Lord's Prayer, Creed, Commandments; and names of the Biblical books are also included. The little book with its eighty pages concludes with the Westminster Shorter Catechism.

The catechism with its condensed theology was regarded as the most important part of the *Primer*, and to a people who firmly believed that children were "young vipers and infinitely more hateful than vipers to God" it was of course

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tremendously important that early and strenuous measures should be taken to save them from the wrath to come. Doubtless there are teachers to-day who think the early estimate of school children quite correct. The *New England Primer* was the best seller of its day. It had a vogue in England and Scotland as well as in America, and up to 1849 it has been estimated that more than three millions of copies had been sold. There were other primers, such as *The Evangelical Primer*, similar in content, but much less popular.

Only a few books available. In the schools of the early colonies books were necessarily few. A catechism or a primer, a psalter, and a testament or Bible comprised the list for the average boy. Pupils in Latin had additional texts. In the beginning it was only natural that almost all of the books were the products of foreign authors. Johnson believes that the only schoolbook of American origin before the Revolution was a little Latin grammar by Ezekiel Cheever, known as Cheever's *Accidence* (1645). It passed through many editions, the last appearing as late as 1838. Lily's *Grammar*, with twenty-five kinds of nouns, seven genders, etc., was studied after the pupil had mastered Cheever's *Accidence*. Among other books in common use were Æsop, Eutropius, and *The Colloquies* of Corderius for the younger pupils; and for the older boys Cæsar, Ovid, Virgil, and Cicero were commonly used.

The religious character of early American schools. The ministers were the official supervisors of the public schools in the colonies. The ministers were also town officers. They were expected not only to exhort but to give the people religious instruction, and of course the children would form a large part of the charge of every minister. The children

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were examined in the catechism, in their knowledge of the Bible, and sometimes in their understanding of the minister's sermons. In 1710, by a Boston enactment, ministers were expected on their school visits to pray with the pupils and to "entertain them with some instructions of piety especially adapted to their age and education." The rural minister was often called upon to teach, especially Latin, in towns that had no grammar pupils. And many of them boarded several pupils as well as taught them.[1] This sort of supervision and close interest on the part of the church tended to make education strongly religious in character, and one finds this influence widely represented in the early textbooks.

Early Spelling Books. Efforts to break away from the stern and narrow religious conception of education appeared in the form of "spelling books." These, however, were not wholly or even predominantly secular, at first. The title of one of the earliest of these spelling books indicates the wider point of view: *The English Scholemaister, teaching all his schollars of what age so ever the most easie, short, and perfect order of distinct readings and true writings our English tongue that hath ever yet been known or published by any.* The contents were apportioned as follows: alphabet and spelling, 32 pages; a short catechism, 18 pages; chronology, 5 pages; writing copy, 2 pages; arithmetic, 2 pages; the remainder of the book being made up of word lists for spelling. It was a thin book of seventy-two pages, published by Coote in 1596. Much of it was printed in Old English black letter.

The most popular of the spellers was Dilworth's *New Guide to the English Tongue*, published in 1740, and in general use until shortly after the middle of the eighteenth century. One

[1] See Johnson, *Old-Time Schools and School Books*, p. 24.

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of the handsomest of the spellers was Watt's *Compleat Spelling Book* (1770). Reference should also be made to Nathaniel Strong's *England's Perfect School-Master* (1676).

That all of the books for children were not formal and pious in those early days is shown in the preface to *The History of Genesis* (1708) which was written to keep children from reading *Tom Thumb*, *Guy of Warwick*, or " some such foolish book." The parents are exhorted not to let their children read " these vain Books, profane Ballads, and filthy songs. Throw away all fond and amorous Romances, and fabulous Histories of Giants, the bombast achievements of Knight Errantry, and the like; for these fill the Heads of Children with vain silly and idle imaginations."

The Child's Weeks Work or A Little Book so nicely suited to the Genius and Capacity of a Little Child Both for Matter and Method that it will infallibly Allure and Lead him on into a way of Reading with all Ease and Expedition that can be desired, was written by William Ronkfley (1712). *The Protestant Tutor* was another English text of the early days. Only a few of these books reached the American colonies and not at all in any quantities.

A glance through the history of American spelling books reveals some striking facts. On account of the war with England it was difficult to get schoolbooks from abroad. A young teacher, only twenty-four years old, in charge of a school in Orange County, New York, seized the opportunity and compiled a spelling book, which was printed in Hartford in 1783. It formed the first part of a *Grammatical Institute of the English Language* and was known as *The American Spelling Book* and more popularly as *The Blue Back Speller.* The author, Noah Webster, received royalties from its sale to

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such an extent that his family was comfortably supported by this book for twenty years, although Webster received only one cent a copy as royalty. When he was eighty-four the sale of the spelling book had reached twenty-four million copies.

A little later in Boston (1805) *The Child's Companion* by Caleb Bingham became an active competitor for popular favor. Its contents were similar to the other spellers, including moralizings, fables, and a list of "Improprieties in Pronunciation." In 1798 a Hartford printer compiled *The Child's Spelling Book.* It contains many pictures and entertaining subject-matter. Caleb Alexander's *The Young Ladies' and Gentleman's Spelling Book* was published in 1799. It showed much improvement in binding, in illustrations, and in general arrangement. A series of poems by Isaac Watts, then very popular, forms the striking feature of the book. In the same year (1799) *The Columbian Spelling Book* appeared, but its general make-up showed much crudity. Another speller with a similar title, *The Columbian Primer*, was offered by H. Mann, of Dedham, in 1802. Its arrangement of material in the form of rimes and interesting pictures made it quite popular. There must have been something hypnotic about the title of these books for in 1827 another *Columbian Primer* was placed on the market in New York. The most noticeable change in the latter was the printing of two cuts to a page where the Dedham *Primer* had used only one.

Contents of Early Spellers. In Fiske's *New England Spelling Book* (1803) there is a page devoted to "Words frequently used in speaking and writing which should be well-learned by every scholar." In the list, among many others, are Damn (capitalized), dirge, and gaol (!). Johnson cites

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from the preface of a speller in 1828 that the early books "contain words collected from all departments of nature, life, and action; from the nursery, the kitchen, the dressing room, the stable, the barroom, the gaming table, the seaman's wharf, the apothecary's shop, from the subtle pages of the metaphysician and the rhapsodies of the pompous pedant." It is not difficult to see whence came the tendency that has prevailed in spelling books until quite recently.

Comly's *A New Spelling Book*, Philadelphia (1806); Perry's *The Only Sure Guide to the English Tongue* (1798); Joshua Bradley's *Lessons in Spellings*, Windsor, Vermont (1815); John Franklin Jones's *Analytical Speller*, New York (1823); Bolles's *Spelling Book*, New London (1831); *The Young Tyro's Instructor*, New York (1834); Parson's *Analytical Spelling Book*, Portland, Maine (1836); *Exercises in Orthography*, Providence, R. I. (1826); and *Companion to Spelling Books* (1843), are among the most prominent of the spellers that influenced the contents of earlier schooling in the subjects of spelling, reading, and general morals.

Readers. Forming the third part of Webster's *Institutes* was the first American reader, published in 1785. Before this time there were no readers in the technical sense of the word. The Bible and various kinds of homilies served as bases of instruction in reading. Webster, however, reached a commendable achievement in his book. The reader contains tales of revolutionary heroes, Indian wars, and also ancient stories. Poetry and dramatic dialogues form a considerable section of the book. Strictly speaking it is more of a guide to declamation than a reader, but its great advance beyond anything of its kind in those days gives it high merit.

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Webster, however, did not get many royalties from this publication. A strong competitor, in the person of Caleb Bingham, published the *American Preceptor*, which by 1832 had reached a sale of 640,000 copies. Webster's book is made up of three parts — "Narration," "Lessons in Speaking," and "Dialogues." His other reader, *The Little Reader's Assistant* (1790), was a rather lugubrious and harrowing series of selections. Bingham's *Columbian Orator* also became popular.

An English Reader by Lindley Murray was another of the readers that made a large place for itself. Abraham Lincoln regarded this as the best schoolbook ever put into the hands of an American youth. In 1823 John Pierpont published *The American First Class Book*. It contains many excellent principles of textbook making, which indeed could be accepted to-day with no little profit. Selections from such contemporaries as Scott, Irving, Channing, Bryant, and Wordsworth form the bulk of the material. Humor and sentiment are included.

Before 1825 there were only a few readers available for beginners. Johnson believes that the first was *The Franklin Primer* (1802). It contained a variety of tables, moral lessons, and sentences, a concise history of the world, hymns, and catechisms. Staniford's *The Art of Reading*, Boston (1807); *The Mental Flower Garden*, New York (1808); Strong's *The Common Reader* (1818); *The Child's Instructor* (1808); *The Child's Instructor and Moral Primer*, Portland, Maine (1822), were among the early publications in this field. Leavitt says in his *Easy Lessons* (1823) that there was considerable need of elementary readers, and this fact accounts for the numerous reading books that now began to appear.

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The Fourth Class Book, Brookfield, Mass. (1827), and the *Clinton Primer* (1830) were attractive attempts to meet the demand. A second *Book for Reading and Spelling*, Boston (1830); Gallaudet's *The Child's Picture Defining and Reading Book*, Hartford (1830), sought to present a variety of reading matter with illustrations that aimed to arouse interest and to instruct at the same time. Gallaudet's illustrations are superior to those of his competitors' books. *The Union Primer* (1832) has some strange lessons in morals. *The Child's Guide*, Springfield, Mass. (1833), contains some keen lessons in observation and interpretation of nature. Pierpont's *The Young Reader* (1835); Lovell's *Young Pupil's Second Book*, New Haven (1836); *The American Juvenile Primer* (1838); Mandeville's *Primary Reader*, New York (1849), are interesting to the student of this subject. In fact the selections in most of the earlier readers deserve approval and in some instances emulation.

Besides the foregoing, *The General Class-Book*, Greenfield, Mass. (1828); Comstock's *Rhythmical Reader*, Philadelphia (1832); *The Christian Reader* (1832); *The Farmer's School Book*, Albany (1837); *The Monitorial Reader*, Concord, N. H. (1839), and Lovell's *Young Speaker*, New Haven (1844), were in popular use.

Grammars. Grammars began to appear in 1580 and 1594 when Bullaker and Greenwood respectively published, the former his *English Grammar* and the latter his grammar written in Latin. Webster's *Institute — Part II* was the *Grammatical Institute of the English Language.* Caleb Bingham's *Young Lady's Accidence: designed for the use of Young Learners, more especially for those of the Fair Sex, though proper for either*, and Lindley Murray's *English Grammar* were in turn followed by an enterprising publication in

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1829, called *The Little Grammarian*. In this book grammatical terms are explained pictorially in a way that might well be imitated in modern schools. For example, the active voice is represented by a teacher with upraised birch (hardly an apt illustration in the modern school); the passive voice by the cowering pupil about to be acted upon; and the neuter by a child seated on a chair near by and in an apprehensive posture.

Arithmetics. Passing to textbooks in arithmetic, we find that these were uncommon among the early colonists. English texts were used before 1788, the first of these being Record's, published in 1540. The Dutch colonists, with their success in commerce at home, believed in emphasizing the study of arithmetic, and one of their regulations regarding the school teacher was that "he is to instruct the youth in reading, writing, cyphering, and arithmetic, with all zeal and diligence." This subject, however, was not taught regularly throughout the colonies. In the villages especially it was neglected. The Puritans, in their orders of 1642, 1647, and 1650, make no mention of arithmetic. Governor Bradford's Journal of 1645, however, refers to the fact that arithmetic was taught in the so-called "free-school" of Boston. There seems to be evidence that the dominant interest of the Puritans in religion crowded out arithmetic after the first few years of its existence. It was taught in private schools in and after 1712. In Dedham and in Plymouth, Mass., and in the colony of Pennsylvania there was provision made for arithmetic, if not in actual orders, at least in actual practice. Delaware and New Jersey probably gave attention to this subject as a means of education. In the southern colonies the several legislatures gave it a place in their school acts.

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In the colonies the first arithmetic was Greenwood's, with the quaint title, *Arithmetick, Vulgar and Decimal with the Application thereof to a Variety of Cases in Trade and Commerce* (1729). It was taught from a manuscript from which the teacher dictated to the pupils, who in turn wrote the examples in their "sumbooks." The first purely arithmetical work in the United States was an edition of Hodder's *Arithmetic*, Boston (1719). A better known book is the one written by Nicholas Pike and published about 1788. It was commended by George Washington. Many of the examples dealt with contemporaneous history, as for example, "General Washington was born in 1732; what was his age in 1787?" How many teachers to-day understand the following rule in Pike's *Arithmetic?* "To find the tare and tret deduct the tare and tret and divide the suttle by 168, and the quotient will be the cloff, which subtract from the suttle and the remainder will be the neat." [1] The book contains 512 pages, of which 4 deal with "plain" geometry, 11 with "plain" trigonometry, 45 with mensuration of superficies and solids, 33 with an introduction to algebra, designed for the use of academies, and 10 with an introduction to conic sections. It is laden with rules.

An Introduction to Arithmetic by Erastus Root, Norwich, Conn. (1796), was widely used for a time. It omits fractions "because they are not absolutely necessary." The arithmetic by Daniel Adams (1801) was a keen rival of the Pike text. Nathan Daboll's *Schoolmaster's Assistant* (1799); Walsh's

[1] Tare means weight of a receptacle apart from its contents; tret means allowance for waste due to transportation; suttle means taken after the tare has been deducted and before the tret has been allowed; cloff means any small deduction of weight; neat, net.

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Mercantile Arithmetic, Northampton, Mass. (1800, revised in 1807 and 1826); Thompson's *The American Tutor's Guide*, Albany (1808); *The Science of Numbers Made Easy* by Leonard Loomis, Hartford (1816); *The Scholar's Arithmetic* by Jacob Willetts, Poughkeepsie, New York (1817), of which fifty editions were printed in a few years, were also in fairly general use. The large volume by Beriah Stevens "containing Vulgar, Decimal and Logarithmetical Arithmetick," Saratoga Springs (1822), was a rather formidable treatise.

Characteristics of early arithmetics. A general characteristic of these earlier arithmetics was their emphasis on ciphering; but with the publication of Colburn's *Intellectual Arithmetic* (1821) a new approach was begun. More than two million copies of this book were sold within the next fifty years. It stresses oral exercises and practical problems. Franklin's *Arithmetic*, Springfield, Mass. (1832), followed Colburn, but besides its purpose to teach numbers it sought to develop moral attitudes toward creation. Barnard's *Arithmetic*, Hartford (1830), was perhaps the first to use pictures. In 1838 Emerson's *The North American Arithmetic, Part First*, appeared with many illustrations. Underhill's *New Table-Book* (1846) had several quaint jingles expressing problems.

Before 1800 at least twenty arithmetics by American authors were on the market. Among these, besides some of those already mentioned, were the following: Benjamin Dearborn (1782), Alexander McDonald (1785), Thomas Sarjent (1788), Consider and John Sterry (1790), John Vinall (1792), Benjamin Workman (1793), Joseph Chaplin (1795), Daniel Flemining (1795), Erastus Root (1796), James Noyes (1797), Chauncey Lee (1797), William Milns (1797), David Kendall (1797), Peter Sharp (1798), Zachariah

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Jess (1798), Ezekiel Little (1799), Nathan Daboll (1799), and David Cook (1800).

It is not surprising that the aim of these early texts and consequently their selection of material stressed the commercial side of colonial life. Arithmetic was very largely a vocational subject with a people whose livelihood was obtained chiefly by trade. The titles of some of the books already referred to indicate the general purpose quite clearly. Daboll says in the preface of his *Schoolmaster's Assistant:* "The design of this work is to furnish the schools of the United States with a methodical and comprehensive system of practical arithmetic."

But while this aim was natural it does seem strange that so little emphasis was laid on making arithmetic automatic. Dilworth's text, for instance, contains only nine examples for drill in addition, and only nine in subtraction. In the 408 pages of Pike's book there are only nine examples of drill in addition, and the same number in subtraction. Adams gives ten drill examples in addition, and nine in subtraction.

The following quotation [1] indicates that even this meager amount of drill in the texts was not used in class.

No boy had a printed arithmetic, but every other day a sum or two was set in each manuscript, to be ciphered on the slate, shown up, and if right, copied into the manuscript. Two sums were all that were allowed in subtraction, and this number was probably as many as the good man could set for each boy. This ciphering occupied two hours, or rather consumed two, and the other hour was employed in writing one page in a copy book. Once, when I had done my two sums in subtraction, and set them in my book,

[1] William B. Fowle, *The Teacher's Institute or Familiar Hints to Young Teachers*, p. 61; and Walter S. Monroe, *Development of Arithmetic as a School Subject*, U. S. Bureau of Education Bulletin, 1917; No. 10, p. 16.

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and been idle an hour, I ventured to go to the master's desk and ask him to be so good as to set me another sum. His amazement at my audacity was equal to that of the almshouse steward when the half-starved Oliver Twist "asked for more." He looked at me, twisted my manuscript toward him, and said, gutturally: "Eh, you gnarly wretch, you are never satisfied." I had never made such a request before, nor did I ever make another afterwards.

Algebra was not generally taught, but the subject had been introduced. John Bonnycastle in his *Introduction to Algebra*, published in 1806, gives this illuminating problem:

A man and his wife usually drank out a cask of beer in twelve days; but when the man was from home, it lasted the woman thirty days; how many days would the man alone be in drinking it?

Geography was not taught in the elementary schools before the Revolution. In the more advanced schools some rudimentary instruction was given in this subject. At first geography was used as reading material, but slowly it won an independent place. Before 1815 two geographies by Jedidiah Morse (1784) and Nathaniel Dwight (1795), respectively, had appeared. An excellent description of these books is given in Johnson's *Old-Time Schools and School-Books*. Maps were scarce, Morse giving two and Dwight none at all. *The Monitor's Instructor*, published at Wilmington, Delaware, appeared in 1804. Later, in 1829, appeared Peter Parley's *Child's Own Book of American Geography*. It abandons the usual order beginning with elementary astronomy and ending with a study of cities. Instead, it takes the young pupil on a sight-seeing trip through America. There are many questions, elaborate pictures, and rather good maps. The book

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was more entertaining than accurate, however. A little earlier than this Benjamin Davies published a geography (1813); Cumming one in 1814; Willard one in 1826; Adams one in 1818. Worcester published his *Elements of Geography* in 1828, and Woodbridge his *Rudiments of Geography* in 1829. Olney's *A Practical System of Modern Geography* was published in 1831, and in the same year *The Malte-Brun School Geography* was placed on the market. All of these early books used the octavo size, but in 1845 Peter Parley's *National Geography* appeared in the familiar flat quarto shape. In 1850 *A System of Modern Geography* was written by Mitchell.

Languages. A glance at the textbooks in language ought to make us devoutly thankful that we did not live in those gloomy days. The schools of to-day, however, have not altogether passed from under the shadow of the type of grammars used in the Middle Ages. Latin, Greek, and Hebrew were the only languages taught in the colonies. Harvard's entrance requirements at the time included the following ultimatum: "Whoever shall be able to read Tully or any other such-like Latin author at sight, and correctly, and without assistance to speak and write Latin both in prose and verse, and to inflect exactly the paradigms of Greek nouns and verbs, has a right to expect to be admitted into college, and no one may claim admission without these qualifications."

Studying began with a simple *Accidence;* then came the grammar, which was memorized in toto. This was followed with *Colloquies* by Corderius or *Orbis Pictus* by Comenius.

The most widely known Latin grammar of the day was Lily's. This was superseded by Cheever's *Latin Accidence*, first appearing in Boston in 1709, and last printed in 1838.

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History. Before 1821 no satisfactory history of the United States had appeared. The following year (1822) C. A. Goodrich published *A History of the United States*. It had a large sale for a dozen years. In many respects it was an excellent piece of work. Noah Webster produced a school *History of the United States* in 1832. Similar works were written by Hale, and Taylor (1830), and Peter Parley. Butler's *Sketches of Universal History* was in use in 1818. It regarded history from the religious point of view. Frost published a history in 1837, Whelping a *Compendium of History* in 1825.

General Criticism of Early American Schoolbooks. The foregoing brief survey of the development of textbooks in this country indicates that many of the subjects which to-day occupy a very prominent place in the program did not at first find favor among educators; arithmetic and geography, for examples. The early primers had a distinctly religious tone. When we recall that education was in the hands of the church, and that at first priests and ministers of the gospel were practically the only persons of any learning in the community, it is not surprising that church and school should have been established together. Gradually, however, the fields of the two institutions began to diverge, and with the separation came textbooks more secular and comprehensive.

Judged by modern standards none of those texts conformed to the needs of the pupil, or to the conditions of hygienic study. They were miserably printed, the paper was of very poor quality, and the organization of the subject-matter, in the main, loose and illogical. To some extent, however, psychological principles were recognized in the provision for illustrations. Some of the problems in mathematics concerned the needs of the community. There were many de-

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tailed questions which served as a guide to a thoroughgoing drill and review. But the requirement of excessive memorizing was too relentless. This defect has not been entirely overcome even to-day.

Another point worthy of notice is this, that in the early schools each pupil brought his own textbook which may or may not have been like the others in the class. Each pupil was taught from his own book. Uniformity was obtained later through district meetings, and still later, trustees or directors, and, in some states, the teachers were ordered to select the schoolbooks. Boards of Education, represented by the superintendent, usually do the work in towns and cities to-day.

The following citation from a letter written by Noah Webster to Dr. Barnard in 1840[1] throws some interesting light upon conditions in the early American public school.

When I was young, the books used were chiefly or wholly Dilworth's Spelling books, the Psalter, Testament, and Bible. No geography was studied before the publication of Dr. Morse's small books on that subject, about the year 1786 or 1787. No history was read, as far as my knowledge extends, for there was no abridged history of the United States. Except the books above mentioned, no book for reading was used before the publication of the Third Part of my Institute, in 1785. In some of the early editions of that book, I introduced short stories of the geography and history of the United States, and these led to more enlarged descriptions of the country. In 1788, at the request of Dr. Morse, I wrote an account of the transactions in the United States, after the Revolution; which account fills nearly twenty pages in the first volume of his octavo editions.

[1] American Journal of Education, Vol. 13, 1865, pp. 123–24.

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Before the Revolution, and for some years after, no slates were used in common schools: all writing and the operations in arithmetic were on paper. The teacher wrote the copies and gave the sums in arithmetic; few or none of the pupils having any books as a guide. Such was the condition of the schools in which I received my early education.

The introduction of my Spelling Book, first published in 1783, produced great change in the department of spelling; and, from the information I can gain, spelling was taught with more care and accuracy for twenty years or more after that period, than it has been since the introduction of multiplied books and studies. (The general use of my Spelling Book in the United States has had a most extensive effect in correcting the pronunciation of words, and giving uniformity to the language. Of this change, the present generation can have a very imperfect idea.)

No English grammar was generally taught in common schools when I was young, except that in Dilworth, and that to no good purpose. In short, the instruction in schools was very imperfect, in every branch; and if I am not mistaken it is so to this day, in many branches. Indeed there is danger of running from one extreme to another, and instead of having too few books in our schools we shall have too many.

The following quotation in an essay by Noah Webster "On the Education of Youth in America" and published in a New York paper in 1788 is not entirely apropos of the present discussion but it is so illuminating and prophetic that its introduction here may be pardonable. Discussing the defects in American education at the time (before and during 1788) he writes:

The first error that I would mention is a too general attention to the dead languages, with a neglect of our own. . . . This neglect is so general that there is scarcely an institution to be found in the country where the English tongue is taught regularly

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from its elements to its pure and regular construction in prose and verse. Perhaps in most schools boys are taught the definition of the parts of speech, and a few hard names which they do not understand, and which the teacher seldom attempts to explain: this is called learning grammar. . . . The principles of any science afford pleasure to the student who comprehends them. In order to render the study of language agreeable, the distinctions between words should be illustrated by the difference in visible objects. Examples should be presented to the senses which are the inlets of all our knowledge.

Another error which is frequent in America, is that a master undertakes to teach many different branches in the same school. In new settlements where the people are poor, and live in scattered situations, the practice is often unavoidable. But in populous towns it must be considered as a defective plan of education. For suppose the teacher to be equally master of all the branches which he attempts to teach, which seldom happens, yet his attention must be distracted with a multiplicity of objects, and consequently painful to himself and not useful to his pupils. Add to this the continual interruptions which the students of one branch suffer from those of another, which must retard the progress of the whole school. It is a much more eligible plan to appropriate an apartment to each branch of education, with a teacher who makes that branch his sole enjoyment.[1]

The Rapid Increase of Textbooks. It is noticeable that gradually the text has found a central place in the American school system. The structure and contents of the textbook have changed to conform to the needs of the successive periods of social development. If the age requires religious reflection and theological programs of study, the school and its equipment must represent this spirit of the times. If society finds

[1] Barnard's American Journal of Education, Volume 13; 124–25.

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freedom of thought and investigation best for its welfare; if invention makes possible broader knowledge and less rigid adherence to present modes of living, the school will reflect this social attitude, and school equipment will be constructed to train the young citizen for this type of civilization. Most of the teaching to-day revolves around the textbook. This may be regarded as distinctly an American practice. In Germany there are no texts in some subjects. In others there are only very brief texts which are abstracts or outlines to be amplified by the teacher. When used they are referred to for review purposes.

Neither the extremely American nor the extremely German practice is to be recommended. Important as the textbook is, its function is limited. The educative process needs to go beyond any one or any group of texts. This extension of method is so current to-day that little needs to be said about it here. On the other hand, the textbook cannot be wholly ignored. Wherever the instructor has begun his work, aiming to avoid all texts, he has soon found it necessary to guide the learner by means of a well-organized presentation of the fundamentals of the course. This is true especially in the abstract subjects, but the need is felt in laboratory courses as well.

QUESTIONS AND PROBLEMS

1. What vehicles for imparting knowledge were used in ancient systems of education?

2. What are the more prominent features of the texts used in mediæval education?

3. Who were some of the leading textbook writers of the Renaissance? What were the characteristics of their textbooks? On what subjects were texts written?

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4. How would you describe the early textbooks in American education? Why was the religious influence so strong in the beginning?

5. Interesting problems for study would be an analysis and comparison of the early and more recent spellers. What changes in these books have been introduced? Is it true that children spell more poorly to-day than in the early years of American education? If so, is this fact due to the spellers used?

6. When did grammar begin to appear as a school subject in America? When did grammars begin to appear in America?

7. When was arithmetic introduced into the American schools? What were the outstanding characteristics of colonial arithmetic texts? Was drill in arithmetic generally given?

8. Trace the origin and development of geography and history in the American public school. What topics were stressed at first? What fundamental changes have taken place in the organization of these subjects to-day?

9. What languages were studied in the early American schools? Why?

10. What do you conclude from Noah Webster's comments on the schools he attended?

REFERENCES

BAILEY, L. H. *Development of Textbooks of Agriculture in North America.*

BARNARD, HENRY. "Schools as They Were Sixty Years Ago." American Journal of Education, Vol. 13; 1865, pp. 123–44.

BOUCHET. *The Printed Book; its history, illustration, and adornment, from the days of Gutenberg to the present time.* Translated and enlarged by Bigemore, London; 1887.

CLODD, EDWARD. *Story of the Alphabet.* Appleton; 1900.

FORD, P. L. *The New England Primer.* Dodd, Mead; 1897.

GREENWOOD, J. M., and MARTIN, A. *Notes on the History of American Textbooks on Arithmetic.* U. S. Commissioner of Educ. Report; 1897–98, pp. 789–869.

Digitized by Google

HAZLITT, W. C. *Schools, Schoolbooks and Schoolmasters.* 2d Ed. Stechert; 1905.

JOHNSON, CLIFTON. *Old-Time Schools and School Books.* Macmillan; 1917.

MONROE, PAUL. *Principles of Secondary Education.* Macmillan; 1914.

MONROE, W. S. *Development of Arithmetic as a School Subject.* U. S. Bureau of Educ. Bulletin No. 10; 1917.

ODELL, A. G. "Educational Tools, New and Old." Journal of Education, 80: 623–5; Dec. 24, 1914.

PARKER, S. C. *History of Modern Elementary Education.* Ginn; 1912. Ch. IV.

PLOMER, H. R. *Short History of English Printing.* London; 1900.

STRONG, H. A. *Old Textbooks.* Westminster, Vol. 179: 680–84; June, 1913.

TAYLOR, ISAAC. *The Alphabet.* Vols. 1 and 2. Edward Arnold.

WEEKS, L. B. *Confederate Textbooks.* U. S. Bureau of Educ.; 1900.

YOUNG, J. W. A. In Hoffman's Zeitschrift XXIX; Jahrg. 1898, p. 410 f. See *Zur mathematischen Lehrbücherfrage.* An interesting set of statistics on German textbooks.

The early volumes of Barnard's American Journal of Education, beginning with Vol. 13, 1863, contain interesting catalogues of old and contemporaneous textbooks.

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CHAPTER III

THE TEXTBOOK — ITS MEANING AND METHODS OF SUPPLY

In the brief survey of the history of the textbook it was noted that in the beginning of school education few kinds of textbooks were available, and then only in very limited quantities, the pupil not having any save as he made his own from dictation. In the Middle Ages the texts were very largely edited editions of the old classics. A few more distinctly organized texts began to appear, especially in Latin grammar. In the American colonies the primers were at first dominated by the religious point of view. Later instructional books in other branches arose, until the textbook as a class by itself assumed a permanent place.

The Textbook Defined. Quite recently the question has been raised as to the exact meaning of the term *textbook*. Is any book used for classroom or study purposes a textbook, or does the meaning imply that the book has been organized for instructional purposes alone? Shakespeare's plays, for example, are literature, but when edited with notes, excerpts, suggestions for study, etc., do they not then become essentially textbooks in literature? The question is important to the extent that it affects methods of teaching.

A few years ago a lengthy controversy arose regarding the exact meaning of *textbook*, commercially. The Tariff Act of

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1913 provides for the free entry of all textbooks, but books not especially provided for carry a customs rate of 15 per cent *ad valorem*. Everyman's Library (the books that provoked the controversy) was classified by the publishers as textbooks inasmuch as many of the volumes were used in the public schools for instructional purposes. The Board of Appraisers and the Customs Court finally decided that this series does not fall within the classification of textbooks.

Any book may be used for instructional purposes within certain limitations, but this hardly entitles it to a place among textbooks which have been organized for sequential and intensive study under a formal organization. In fact, the proper organization of material is one of the fundamental factors in a sound textbook. By the aid of its arrangement of subject-matter both teacher and pupil may proceed psychologically and logically in the pursuit of a study. The point is obvious enough, but one finds in many instances that books, otherwise valuable, have been introduced as texts when they are wholly unsuitable for this purpose. This is perhaps more true in literature and history than in other subjects. *Doubtless the most important of all questions concerning the textbook is its organization of subject-matter.* This gives character and educational significance to the book. The textbook must be a well-systematized arrangement of a subject so that its formal study may proceed in an orderly sequence.

Kinds of Textbooks. Various classifications of textbooks have been made. Dr. W. C. Bagley offers the following list: readers; manuals or handbooks, such as arithmetic and grammar texts; textbooks proper, such as geographies, histories, physiologies, etc. The wider scope of methods, however, requires a more comprehensive classification.

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The following is suggested:

1. Primers and readers.
2. Manuals or handbooks.
3. Textbooks proper.
4. General literature when especially organized by author or teacher for study purposes.
5. Periodical literature when treated educationally.
6. Lecture notes, syllabi, and manuscripts.
7. Sunday School quarterlies, Lesson Leaves and Bible Study notes, such as Peloubet's or the series written by Martha Tarbell.

Magazines. The sixth group in this list finds little place in the public school but it occupies a prominent (perhaps a too important) place in college and university instruction. Of the fifth group much could be written. Its inclusion in the public school marks one of the notable stages of advance in the technic and motivation of teaching. Newspapers and magazines appeal to youth, for in them one finds variety, simplicity, and no little beauty (one thinks immediately of such a periodical as the "National Geographic Magazine"). They are universally popular and in daily use. The pupil who is assigned work in this sort of textbook feels that he is doing just what his father and elders are doing when they read at home. High school work appears to him as having connections with life, and that it is in a true sense really practical. Moreover, not infrequently the newspaper will reprint a novel by Hugo or Scott and in this way stimulate interest in these authors. The book repels interest where the newspaper and periodical awaken zest in study. It should be recalled that many, if not most, of the great novels by English masters appeared serially. Perhaps one reason for the appeal of the periodical

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lies in its brevity. One does not feel discouraged at the sight of numerous and closely printed pages as with a book.

General literature. The fourth group is in danger of being overemphasized. There has been long current the viewpoint that in order to study literature it is necessary to analyze a literary product minutely, well-nigh exhaustively. Annotations by this and that editor are studied, and elaborate notebook work is required, until the pupil doubtless feels as the passenger on a local train. There are seemingly more stops than a meaningful approach to any goal. The pupil is lost in the wilderness of detailed explanation and interpretation, and perhaps fails to get any connected and artistic conception of the masterpiece assigned him. Many times the author's notes are unsatisfactory, and much time is consumed in trying to find them. For convenience it would seem that explanations should appear on the same page as the passage treated, and not at the end of the book.

Classification on basis of style. Another classification of textbooks might be made on the basis of the principles controlling the author's style of composition. Some textbooks are purely theoretical. The author seems to have sought only abstractions, finding in a pompous and obscure rhetoric a vehicle for impressing the reader with the madness of much learning. Obviously such books have no appeal for pupils in the public schools. But many textbooks in mathematics and physics (not to speak of the languages) have this lifeless atmosphere.

On the other hand, one finds the textbook made up of a bewildering array of facts, a collection of problems or data with no consistent organization, no pedagogical foundations. The book appears to be a hasty commercial enterprise. The

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problems in most cases are purely disciplinary. The book is a museum or an exhibit of knowledge. Its only purpose seems to be to unfold certain parts of the subject but not at all to develop vital initiative, broad understanding, and genuine creative interest.

Between these extremes are the textbooks whose contents suffer with overfeeding. Theory and facts and copious explanations have been amassed in formidable bulk without any apparent discrimination of educational values. There is organization but it is all on one plane. The average teacher who attempts to complete the course outlined in such a book will certainly break down in the attempt. The author has had only an exhaustive treatment of the subject in mind. It may be a valuable and up-to-date discussion, but the book gives little evidence that the author had a particular kind of pupil-group in mind, or any conception of curriculum making as controls in the organization of his book.

A fourth kind of textbook does reveal evaluation but again it is the author's own reaction. He has not weighed the material in the light of any carefully considered principles of educational values. In history, for example, wars are, to him, more important than institutions. Political and military dates seem to him to be more vital than industrial and economic progress. The book is overbalanced with material that is either of the traditional sort found in most texts on the subject, or the selection of subject-matter rests on a theory of educational values that apparently has not considered the needs of pupils in our modern industrial and democratic age. It ought to be clear that a textbook must represent a consensus of the most modern opinions on the subject of which it

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treats. This opinion will undergo revision, and as it changes the textbook must be altered. A one-man textbook may have many commendable features but for the best educational results the book must express the judgment of a large group of investigators who have found certain emphases desirable in the respective subjects.

There remains for mention the textbook whose contents have been selected and arranged with the pupils constantly before the author. Their point of view, the range of interests natural to their stage of development, and the fundamentals of social application possible by means of his particular subject, — these control his organization and stimulate an easy, clear, attractive style which makes the book what it is intended to be — an introduction to knowledge and a means of stimulating and directing the pupil to obtain, largely by himself, the salient data of the subject.

The Free Textbook. Considerable discussion has arisen lately regarding the advantages and disadvantages of the free textbook. Many citizens hold the opinion that inasmuch as they are taxed for the support of the public school system it ought to be unnecessary, and it appears to be unfair, to require them to increase their taxes by paying for textbooks. Many parents cannot afford to buy as many books as are needed. There has been, for these and other reasons, a steady increase in the free textbook policy.

The earliest free textbooks were provided by cities, Philadelphia in 1818 being the first. Other cities have found it advisable to introduce free texts. Jersey City did so in 1830; Newark in 1838; Charleston, S. C., in 1856; Hoboken and Elizabeth, New Jersey, about 1860; Chester, Penn., in 1864. The first state to pass a mandatory state-wide free textbook

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law was Massachusetts in 1884. The following states now have similar free textbook laws:

Arizona	District of Columbia	Nebraska
California	Maine	Nevada
Delaware	Maryland	New Hampshire
New Jersey		Utah
Pennsylvania		Vermont
Rhode Island		Wyoming

In seventeen other states school districts may supply free textbooks if they so desire:

Colorado	Kansas	Montana
Connecticut	Michigan	New York
Idaho	Minnesota	North Dakota
Iowa	Missouri	Ohio
South Dakota		Washington
Texas		West Virginia
		Wisconsin

In New York State textbooks may be furnished in any city district and in any union free school district by the school board if a special tax is voted. In sixteen other states many cities and other districts are supplying free texts without being required to do so by any state legislation.

In Missouri, whenever provision is made for free texts in at least the first four grades in the public schools of a district, the county subapportions annually to each such school district, from the county foreign insurance tax moneys received from the state, an amount to be determined by multiplying the number of children on the last enumeration list by the ratio used by the state auditor in making the distribution of

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such moneys among the counties of the state. A school district containing an incorporated town or city is not entitled to such aid.[1]

Conditions in Colorado[2] may represent some of the difficulties regarding free textbook administration elsewhere. The Colorado law provides that the purchase of free textbooks in any school district shall be at the discretion of the qualified electors. The board of directors is required to furnish books free to all children when instructed to do so by the voters; but it is not allowed to change an adopted text oftener than once in four years, nor to provide more than one kind of text of the same grade or branch of study in the same department of a school. The latter requirement is not generally observed in the larger districts, but reports from teachers show that very few of the rural schools are provided with supplementary texts in reading, geography, and other subjects.

About three fourths of the children of Colorado are furnished with textbooks by the districts in which they live. All cities with special superintendents supply their books. Out of 1846 districts in the state 845 (or about 45 per cent, with an enrollment of nearly 75 per cent of the school children) furnish textbooks at public expense.

There is general complaint that school directors in rural districts fail to supply books promptly and of a proper kind. And school directors complain that every teacher wants a different kind of book. The county superintendent's report confirms both sides of the case. Many of the books are out of date and also in other ways unsuited to school work in the locality where they are used. There is practical uniformity

[1] U. S. Bureau of Educ. Bulletin, 1915; No. 22, p. 24.
[2] U. S. Bureau of Educ. Bulletin, 1917; No. 5.

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in at least ten counties, but in the remaining fifty-two counties there is extreme variety.

The U. S. Commissioner's Report concludes with the recommendation that the free textbook law should be made mandatory instead of optional, in order that all children in the state may be furnished with proper books. Legislation should be passed requiring all publishers who wish to do business in the state to submit to the state board samples of books with the net price list; to sign a contract agreeing to supply books to school authorities at the prices quoted, which shall be as low as in other states under similar conditions, and to file a bond of from $2000 to $20,000 to be forfeited in case the contract is violated. The state board should publish a list of books, the publishers of which have complied with the law, with net prices for the convenience of school authorities in making their selections. The state board should omit from the published lists any undesirable books, even if the publishers have complied with the state law relative to the filing of samples, price list, and bond.

General distribution of free texts. In a study made of school administration in the small cities[1] it was found that 593 cities, of 1257 reporting, furnished free textbooks, 366 being in states that require free textbooks, and 227 in those that permit them to be furnished free. In 530 of the 593 cities where textbooks are provided free the city board supplies the books, while in 63 cities the state does so. In 744 of the 1257 cities reporting, stationery and pencils are also furnished free.

The Advantages of Free Textbooks. The following arguments in favor of free textbooks have been presented from time to time:

[1] U. S. Bureau of Educ. Bulletin, 1915; No. 44, by W. S. Deffenbaugh.

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1. The cost is placed on the district rather than on the individual; there is a lower per capita cost.

2. Economy is made possible through large orders. (The Russell Sage Foundation Bulletin 124 says about 20 per cent is saved in this way.)

3. Books may be changed with little inconvenience whenever different texts are found necessary.

4. Uniformity of textbooks in each school administrative district is secured. This would reduce much of the confusion in the transfer of pupils from school to school. Many superintendents find this to be true.

5. Poor children may attend school equipped in this respect as well as the more well-to-do children.

6. A larger enrollment is possible because the cost to the parent is less. (The Massachusetts law on free texts resulted in a 10 per cent increase in high school enrollment.)

7. Everybody has a book, and the school work can start promptly the first day.

8. Additional or supplementary texts may be provided for the enrichment of the teacher's point of view, scope of illustrations and applications. Such additional texts are available also for the wider study of a subject by the pupils.

It would seem that in the effort to establish universal education nothing should be left undone to bring educational advantages to poor and rich alike. In the present advance of the cost of living, and the danger of sacrificing education for the business of war, it is all the more needful that the state make it possible for everybody to share in the benefits of public school training. The free textbook should, therefore, be given to all who enroll in the public schools. It would be undemocratic to provide free books only for the poor. We cannot

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afford to single out for public and visible charity any boy or girl in democracy's great agency of uplift. The textbook must be free to everybody or to none at all.

Disadvantages of the Free Textbook. It must be admitted, however, that free and uniform textbooks have certain disadvantages. These have been summarized by Mr. Monohan of the United States Bureau of Education and by others as follows:

1. Parents and pupils are made to realize that they become wholly dependent on the state. They should assume some of the responsibilities of education.

2. Increased school taxes would be necessary if free textbooks were provided.

3. Children should not be required to use books soiled by other children.

4. Free textbooks are likely to be carriers of disease.

5. By the parent purchasing textbooks home libraries may be built up. The pupil would have a collection of reference books.

6. Books furnished free are not cared for as well as those owned by the pupils.

7. The lack of the sense of possession is a weakness in the development of self-respect.

8. The free textbook cannot be marked and reorganized for study purposes as conveniently as one owned by the pupil.

9. It is difficult to recover books from pupils who drop school and move away. Hence the cost of equipment is raised and waste is increased.

Some of these arguments have weight. There are parents who expect too much from the state. Many of these parents give but little to society, but are content to let others pro-

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vide them with the advantages of a democracy. It doubtless is true that handling books soiled by children improperly trained in the home, is objectionable to children with more cleanly habits. The same disadvantage, however, is found in free public libraries and in school libraries. A weekly inspection of the textbooks and drill in removing the stains that can be erased would meet this objection to some extent.

Unquestionably the strongest argument against free textbooks is the fourth on the list. They do carry germs of infectious diseases. A careful record of pupil and home health, however, and scrupulous disinfection of all books between terms would relieve this condition to no small extent.

It is doubtful if the purchase of school books by the home would greatly augment the home library. And a library of textbooks would be a rather uninteresting affair. Besides, textbooks soon become out of date. Furthermore, the secondhand book business would prevent the increase of the home library.

If the school teachers supervise the care of textbooks by means of drills in the care of the book, it is likely that the school-owned book will be as neat and well preserved as any book owned by the pupil.

Employing the devices discussed in Chapter V would partly answer the objections under 8.

In connection with the policy of free textbooks it is important for teachers to adopt some scheme of distributing and supervising the care of the books loaned to the pupils. A record should be kept of all books given out; a receipt or checking scheme for all books returned. The pupil must be cautioned regarding the proper care of the book. Providing covers becomes part of the pupil's responsibility at this point unless

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the school itself supplies heavy manila covers. The following record card is suggested:

RECORD CARD OF BOOKS LOANED TO PUPILS

NAME OF PUPIL_____ HOME ADDRESS_____

GRADE_____ SUBJECT_____

NAME OF BOOK_____

CONDITION OF BOOK			DATES OF LOAN		CONDITION OF BOOK ON RETURN				DISPOSITION OF BOOK		
New	Good	Fair	Loaned	Returned	Excellent	Back broken	Torn pages	Soiled badly	Loaned again	Sent for repairs	Discarded

FIGURE I

This record card might be kept by a trustworthy pupil, called the class librarian. If this office is treated as one of responsibility and honor, the pupils will accord it respect and serve its purpose conscientiously.

Uniform Textbooks. Another serious problem deals with state uniformity of textbooks. The advantage of such a policy lies in the reduction of cost made possible by large sales, and also the ease with which pupils transferred from school to school can adjust themselves to new conditions. The following states have uniform textbooks:

Alabama	Florida	Indiana
Arizona	Georgia	Kansas
California	Idaho	Kentucky

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Louisiana	Montana	New Mexico
Mississippi	Nevada	North Carolina
Oklahoma		Tennessee
Oregon		Texas
South Carolina		Utah
	Virginia	

It has been pointed out by investigators in this field that these states fall into two large groups, the Southern and the Plateau States. Both of these have comparatively new public school systems. Where pioneer conditions seem to predominate, it is important educationally that some central control unify growth until strength and confidence have been gained for more diversified organization.

Arguments for and against uniformity. Which policy is better, state uniformity or local option, has not yet been finally determined. Doubtless too much of either would prove detrimental. Some writers on the subject believe that

> The unit of local adoption should always coincide with the unit of supervision. . . . . the same authority that prepares the course of study and supervises its execution in the schools should select the books that will prove most effective in carrying out that course of study. . . . Supervision, course of study, and adoption of texts rightly belong together.[1]

The advantage of such a scheme is more apparent than real, say the proponents of state uniformity. The needs of pupils throughout a state are not so varied that wholly different kinds of textbooks are necessary. Local needs are easily provided for by the teacher's supplementary material.

[1] Cubberley and Elliott, "State and County School Administration — Source Book;" Macmillan, 1915.

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Many local boards, with the laborious process of adopting texts, would simply multiply a task difficult enough for a state board to perform.

Doubtless few central boards adopt any text without consulting with educational experts, who may be expected to understand the merits of a good text. While diversity is necessary in a democracy like our own, there is also need of unifying agencies, and particularly so with a migratory population like our own.

The argument that uniform textbooks are desirable because when pupils move from place to place they must change books, may be answered in two ways. First, the local community might buy the pupil's old books and the money could then be used for buying the new books. Second, while the number of high school transients is large these pupils after all are in the minority. The state must legislate principally for majorities. It is not always feasible to give recognition to individual exceptions.[1]

Professor John Adams inquires whether national uniformity in textbooks is desirable.[2] There is a considerable amount of material that is taught everywhere. Take the subject of arithmetic for example. Adams supposes, for the sake of argument, that national uniformity in this subject is possible. By such national agreement social communication might be enhanced to an even greater degree than now obtains. Again, in history, if a government desires a special set of books in this subject, and prescribes them for use in the school, it can

[1] An excellent Summary of laws regarding *Free Textbooks and State Uniformity* may be found in the U. S. Bureau of Educ. Bulletin, 1915, No. 36, by A. C. Monohan.

[2] *Evolution of Educational Theory*, pp. 388–90. The Macmillan Co., 1912.

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lift the new generation to present ideals and purposes in a comparatively short time.

The obvious answer to any proposal of national uniformity in textbooks is, of course, that in this country there is no federal control of education. But if there were such a central authority it would still be highly doubtful whether or not such control would be advisable. The hope of the textbook situation is that full and free competition makes possible improved texts and a change of texts whenever needed. It would be a gloomy day for education if a central authority or representatives of a national party in power dictated the contents of study and ordered textbooks of an ultra-biased point of view.

If the minimum essentials in the various subjects can be determined it would perhaps be economical to have brief texts containing only these fundamentals. Supplementary material could then be prepared in the form of pamphlets, to be used only by the teachers. Such an arrangement would possibly curtail the large quantity of material that is now deemed essential for pupils to study.

The Cost of Textbooks. It is easy to generalize and to exaggerate conclusions regarding nation-wide movements and expenditures. It is commonly believed that vast and inordinate sums are expended yearly on educational equipment. Taking the expenditures in bulk, the figures do loom large. Nearly a billion dollars a year spent on education, directly and indirectly, seems a tremendous outlay to individuals who fail to estimate the cost of education in comparative terms. And in the making and buying of textbooks it is quite popularly believed that too much money is given to publishing houses and to authors.

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In considering this subject, the cost of textbooks, it will be interesting to consider first the cost of making them. When this information is before us it may be that the cost of textbooks to the schools or to the citizens will not seem as exorbitant as now appears to be the case.

Cost of making textbooks. The making of textbooks is a fine art, and one which has been slowly developing for many years. Because it really is a fine art, there are varying degrees of excellence among textbooks. Some lack style, others ride a hobby, some lack the results of wide experience on the part of the author, and many are wanting in the essentials of thorough scholarship. When a textbook publisher has a series of books that have been tested and not found wanting — and be sure that it has taken years of the hardest kind of work, much money ventured, and much lost in unsuccessful experiments — he still has before him ever-present troubles and expenses that no one but another publisher dreams of. A textbook must be kept strictly up to date. Every history that touches modern times must have something added to it every year. The United States Census every ten years costs the textbook publisher, especially the publisher of geographies, more in proportion than it costs the government. Between fifteen and twenty thousand dollars have been spent in a single year after the Census returns began to come out, by one publisher in correcting the plates of a series of geographies. This expense did not include the loss of the old stock of books that had to be destroyed.

Moreover, the first cost of textbooks is vastly greater than that of any other books, first cost meaning the cost of setting the type, making electrotype plates, and the illustrations and maps where these are required. And no other books use

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maps and illustrations so abundantly. The cost of maps for a series of geographies may be forty thousand dollars, and the entire first cost of such a series more than a hundred thousand dollars.

The first cost of a primer runs from two to four thousand dollars, and is always a large sum because primers must be abundantly illustrated with the very best pictures available for the purpose. Compare these prices with that of the ordinary novel, whose first cost will hardly exceed six hundred dollars. Yet the selling price of the novel ranges from one dollar and twenty-five cents to one dollar and a half, while the primer sells for but twenty-five or thirty cents.[1]

The entire volume of the textbook business in the United States is about twelve million dollars a year, divided among one hundred publishers.

Cost of textbooks to the citizens. The second consideration under the cost of textbooks concerns the amount of cost to the consumer. If the state were relieved of the burden of supplying texts would there not be considerable reduction in taxes, — ask the citizens who so easily exaggerate? But a careful survey of the cost, compared with other expenditures, throws a rather different light on this aspect of public education. The following approximate outlays do not indicate that too much money is used up in schoolbooks. In the United States we spend approximately the following amounts per annum for some of our luxuries and necessities:

Spirituous liquors	$579,000,000,	an average of $5.79 per person
Boots and shoes	512,000,000,	an average of 5.12 per person
Tobacco	417,000,000,	an average of 4.17 per person
Bread and bakeries	397,000,000,	an average of 3.97 per person

[1] Chas. H. Thurber, "What about Textbooks?" *Outlook*, Sept. 13, 1913.

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Moving pictures	275,000,000,	an average of $2.75 per person
Automobiles	249,000,000,	an average of 2.49 per person
Agricultural implements	146,000,000,	an average of 1.46 per person
Patent medicines	142,000,000,	an average of 1.42 per person
Confectionery	135,000,000,	an average of 1.35 per person
Coffee	100,000,000,	an average of 1.00 per person
Chewing gum	25,000,000,	an average of 0.25 per person
School books	17,000,000,	an average of 0.17 per person

The enrollment in elementary and secondary education in this country is about 19,000,000. The annual cost of school books per pupil is approximately seventy-eight cents. About two per cent of the total cost of school maintenance, support, and equipment is spent annually on textbooks. The cost per child on the school population basis (5–18 years of age) is approximately fifty-six and six-tenths cents and the annual cost of textbooks per pupil nearly seventeen cents. These data seem to answer the second objection to free textbooks in the list on page 53. Shown graphically the relative cost of school books appears as shown in Figure II (p. 62).

The increase of prices within the last year will, of course, raise the per capita cost of school books, but it is probable that the distribution of expenditures as shown in the table and in the graph will remain about the same, *i.e.* school books will hold approximately the lowest place in the scale of expenditures.

Convenient method of introducing free texts. If conditions make it impossible to meet the initial cost of providing books, the gradual introduction of them as suggested by Cubberley is to be commended. He says:

A good beginning might be made by supplying in the elementary schools everything except the regular textbooks; this would probably cost about $2 per pupil per year, of which about one half would

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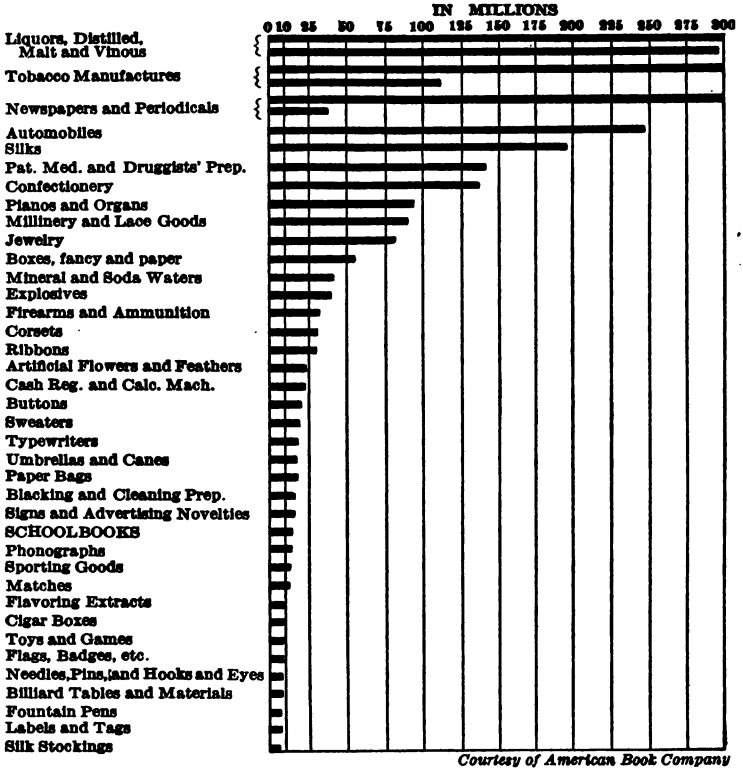
COMPARATIVE ANNUAL COST OF SCHOOLBOOKS AND SOME OTHER ARTICLES IN COMMON USE IN THE UNITED STATES



Courtesy of American Book Company

This diagram is based on the latest and most accurate official statistics — the U. S. Census Bureau Bulletin, 1910; the Report of the U. S. Commissioner of Education, 1911–12; and the separate reports of State Superintendents of Public Instruction.

The annual amount expended for textbooks for public schools is approximately $12,000,000.

FIGURE II

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be necessary for stationery and other quickly consumed supplies, while the other half should be expended on supplementary books and other relatively permanent material. By spending this amount for three or four years, a good supply of supplementary books and other relatively permanent materials would be accumulated; then, without much increasing the annual costs, the district might undertake to supply the regular texts in the elementary schools. All books would, of course, be loaned, not given, to pupils. When the system of furnishing books and supplies by the district had been once completely established, it could be well maintained at an annual expenditure not exceeding $2 per pupil in the elementary schools.[1]

State Publication of Textbooks. In the effort to reduce the cost of textbooks, two states have undertaken to produce their own school books. California and Kansas, in their efforts along this line, have not yet reached unanimous agreement that state production is either cheaper or productive of better, if as good, texts. In discussing this subject Dr. John Franklin Brown reaches the following conclusions:

1. In no case is lower cost to the people proved if all the expense factors are taken into account.
2. Books produced under state publication are always inferior in mechanical features.
3. They are often inferior pedagogically.
4. There is often serious delay in delivery of books.
5. It is difficult to change to a better book.
6. Pupils are sometimes limited to the use of a single book, supplementary books being barred.
7. The state should engage in no business enterprise which can safely be left to private effort.

[1] *The Portland Survey*, World Book Co., 1914, p. 161.

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8. State publication provides an easy road to inefficiency and graft.
9. It subordinates school interests to political exigencies.
10. It violates the professional spirit of teachers.
11. It discourages authorship and competitive publishing effort.
12. It emphasizes cost rather than quality of educational equipment.

At first glance it would seem logical that the state which supports the public school should also produce its own educational equipment. In every state there doubtless are persons capable of writing texts of merit. But the most serious objection to this seemingly obvious plan of state publication lies in subjecting scholarship and educational progress to the control of politics. We do not need to be reminded that there is altogether too much political graft and chicanery in education at present without creating opportunities for more. While true that the present conditions prevailing in book adoptions are far from ideal, no assurance is offered that state publication would provide conditions more ideal. All of the arguments presented by Dr. Brown are valid. Until states like Kansas can prove beyond the shadow of a doubt that state publication is superior to the plan now widely in vogue, it will be wise to make it possible for competing publishers to produce even better texts, excellent as very many of them now are.

The following data by H. L. Shirer of Topeka, Kansas, throw light on conditions of state publication in Kansas. In this state where experiments in civic management are courageously undertaken, state publication has been given a fair trial. The following table gives the exact number of books bought by pupils in 1912–13 at the established retail prices:

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TABLE I

Books Sold	Title of Book	Retail Price	Total
209,568	Speller	11 cents	$23,052.48
68,526	First Reader	11 cents	7,537.86
58,946	Second Reader	19 cents	11,199.74
58,471	Third Reader	25 cents	14,617.75
79,117	Fourth Reader	33 cents	26,108.61
78,119	Fifth Reader	44 cents	34,372.36
109,691	Elementary Arithmetic . .	28 cents	30,713.48
132,379	Advanced Arithmetic . . .	39 cents	51,627.81
85,182	English, Book One	22 cents	18,740.04
113,938	English, Book Two	39 cents	44,435.82
40,190	Civics	44 cents	17,683.60
16,000	U. S. History	55 cents	8,800.00
27,758	First Hygiene	30 cents	8,327.40
254,608	Writing	5 cents	12,730.40
			$309,947.35

Against this total the pupils turned in on the exchange the following:

TABLE II

Books Sold	Title of Book	Exchange Price	Total
88,209	Speller	5 cents	$4,410.45
10,218	First Reader	5 cents	510.90
14,077	Second Reader	8½ cents	1,196.54
19,436	Third Reader	11½ cents	2,235.14
30,626	Fourth Reader	15 cents	4,593.90
36,422	Fifth Reader	20 cents	7,284.40
47,869	Elementary Arithmetic . .	12½ cents	5,983.62
47,651	Advanced Arithmetic . . .	17½ cents	8,338.92
16,940	Civics	20 cents	3,388.00
41,403	English, Book One	10 cents	4,140.30
54,778	Grammar	17½ cents	9,586.15
			$51,668.32

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While the gross sales amounted to $309,947.35, the pupils were paid for their old books $51,668.32, making the net purchases by pupils, $258,279.03.

Against this statement should now be placed the same quantities of books, etc., at state publication prices as established for 1917–18. It will be assumed of course that more books will be sold this year than were sold in 1912–13 and that the pupils thereby lose more because they cannot turn in for exchange the old books. That only increases the total cost to pupils.

TABLE III

Books Sold	Title of Book	State Publication Retail Price	Total
209,658	Speller	16 cents	$33,530.88
68,526	First Reader	23 cents	15,760.98
58,946	Second Reader	27 cents	15,915.42
58,471	Third Reader	21 cents	12,278.91
79,117	Fourth Reader	25 cents	19,779.25
78,119	Fifth Reader	29 cents	22,654.51
109,691	Elementary Arithmetic	28 cents	30,713.48
132,379	Advanced Arithmetic	39 cents	51,627.81
85,182	Language, Book One	23 cents	19,591.86
113,938	Grammar	34 cents	38,738.92
40,190	Civics	30 cents	12,057.00
16,000	History	52 cents	8,320.00
27,758	Hygiene	22 cents	6,106.76
254,608	Writing	8 cents	20,358.64
			$307,434.42

It will be seen from this tabulation that state-published books have cost the pupils this school year, 1917–18, a total of $49,155.39 more than they were paying for the same books under the uniformity law, when the state had no investment

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and the whole burden of financial responsibility was placed on the publishers.

The above list does not include all the books being published by the state but only books published for the first time this school year. It is safe to say, however, that the state has established no price that could not easily have been duplicated by contract, and has produced no book from manuscript that has developed any particular educational value beyond others of its kind.

Furthermore, it should be noted that authors (there are approximately thirty-five thousand in this country) are distributed over a wide area. In no one state is it likely that all the subjects have prominent specialists. There is also in state publication the false assumption that anybody who knows a subject can produce an adequate textbook of this subject. The outstanding weakness in textbook writing is not lack of scholarship, but the lack of an educational program, the absence of any practical conception of how the understanding of a subject develops in the mind of the pupil. Anybody can throw together facts and call it a textbook. To-day, however, we demand something more educational than an encyclopedic textbook. Many of the latest textbooks give evidence of the author's ability to organize subject-matter from the psychological as well as from the logical point of view, with considerable emphasis on the former.

Summary. A textbook differs from other kinds of books in its organization of material for the purpose of formal education. Its selection of material aims to meet the needs of pupils at various stages in their school career. While formerly instruction and training depended upon one book on a subject, to-day there are many kinds of books used in class

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work, and besides these, periodicals and pamphlets not specifically in the textbook group. The extension of public school education and its enrichment of subject content have brought about the need of free texts (without which compulsory education might be impossible), and a certain amount of uniformity throughout a particular state. Extreme local option or exclusive state uniformity seems undesirable. No small problem in the question of free and uniform textbooks is that of cost. While the cost of textbooks is less than that of other items in school expenditure it is still heavy, both from the publisher's and from the consumer's standpoint. The fact that the consumer is the public school system is no good reason for ignoring the item of cost. It is important, however, that taxation be liberal enough to make it possible for the educator to procure the latest and the best texts, and also to supply a sufficient variety for each class so that the pupil's point of view need not be confined to a one-text interpretation of a subject.

QUESTIONS AND PROBLEMS

1. Define a textbook.

2. How would you revise or supplement the classification of textbooks given in this chapter? Classify the kinds of books that you use for instructional purposes.

3. When and where were free texts first used in this country? Is the free textbook universally used in the United States?

4. What are the advantages of the free textbook? The disadvantages? Which of the former and which of the latter seem to you most significant?

5. What are the chief objections to state uniformity of textbooks?

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6. How much do the textbooks cost your community? Does this cost exceed the average for the country as a whole?

7. Why is state publication of textbooks undesirable?

REFERENCES

BROWN, G. E. "Should the State publish its own textbooks?" Journal of Education, 81: 566–67; May 27, 1915.

California. Council of Education. Report. Sierra Educational News, Vol. 8: 222–38, May, 1912. State Board of Education. "Concerning high-school textbooks in California." Sacramento, 1914. Bulletin No. 1. "State textbook plan reviewed." Biennial report, 1909–10. Sacramento, W. W. Shannon, Superintendent State Printing, 1910: pp. 59–66.

"The California textbook plan." Journal of Education, Vol. 69: 173–80; February 18, 1909.

CHANCELLOR, WILLIAM E. "The government publication of school books." School Journal, Vol. 80: 218–20; April, 1913, Vol. 81: 161–4; March, 1914.

Commonwealth Club of California. "State textbooks." San Francisco, Cal., 1912: p. 315–74. 8°. (Transactions, Vol. 7, No. 3, Aug., 1912.)

CORNELL, L. S. "State Uniformity of Textbooks." N. E. A. Proceedings, 1888; pp. 225–37.

COVELL, L. E. "Should the free textbook system be adopted?" Minnesota Educational Association. Journal of Proceedings and Addresses, 1909. Minneapolis, Minn., Syndicate Printing Company; pp. 151–55.

COX, E. M. "Free textbooks." Western Journal of Education, Vol. 8: 89–97; February, 1903.

CUBBERLEY, ELLWOOD P. "Textbooks." In Cyclopedia of Education. Ed. by Paul Monroe. Vol. 5. New York, Macmillan, 1913. pp. 756–78.

DUTTON, SAMUEL T., and SNEDDEN, DAVID. "Free textbooks." In *Administration of Public Education in the United States*. New York, Macmillan, 1908. pp. 216–23. (Rev. ed., 1912.)

EVANS, LAWTON B. "State publication of textbooks." School and Home. Vol. 6: 7–10; June, 1914.

Digitized by Google

"The Facts about Schoolbook costs." American School Board Journal, Vol. 46: 13–4, 52; March, 1913.

FAULKNER, RICHARD D. "The California State Textbook System." Educational Review. Vol. 20: 44–60; June, 1900.

"Free Textbooks." Outlook. Vol. 112: 643–47; March 22, 1916. (Also School and Society, Vol. 3: 608–10; April 22, 1916.)

GATHANY, J. M. "Weekly outline study of current history." Outlook, 1917.

Georgia. General assembly. Schoolbook Investigating Committee Report. (Atlanta) 1914. (See also Journal of Education, Vol. 80: 40, July 19, 1914.)

GINN, E. "Schoolbooks, the Publisher and the Public." Independent, Vol. 69: 222–5, Aug. 4, 1910.

GUFFIN, JAMES T., comp. Report of the hearing on schoolbook legislation before the joint committee of the senate and house of representatives, Lansing, Michigan. Feb. 19, 1913; with an appendix by the publisher. (Chicago, J. T. Guffin, 1913.)

HARTWELL, E. C. "Magazine Reading in the High School." Independent, Vol. 77: 451; March 30, 1914.

HUNTING, W. J. "Free Textbooks." In Nevada State Teachers' Institute and State Educational Association. Proceedings and addresses, 1908. Reno, Nev., pub. by the Association, 1909, pp. 26–33.

JENKS, JEREMIAH W. "Schoolbook Legislation" (in Indiana). In his *Citizenship and the Schools*. Holt, 1906. pp. 207–64. (Also Pol. Sc. Quarterly, March, 1891.)

Kansas. "Criticism of textbook publication." Elem. Sch. Jour., Vol. 17: 537–40; April, 1917; Vol. 13: 414–5; May, 1913.

KLINGAMAN, O. E. "Textbook legislation in Iowa." Iowa City, State Historical Society of Iowa, 1915. (Also Iowa Jour. of Hist. and Pol., Vol. 13: 53–113; Jan. 1915.)

MCCRAY, D. O. "Kansas, Wise and Otherwise." Jour. of Educ., Vol. 80: 200–2; Sept. 10, 1914.

MCGREGOR, FORD H. "Free Textbooks." American School Board Journal, Vol. 36: 27, April, 1908.

MARSHALL, WILLIAM I. "Should the public schools furnish textbooks free to all pupils?" Chicago Free Textbook Committee of the Illinois State Teachers' Association, 1898.

Digitized by Google

Michigan. Superintendent of public instruction. "Textbook legislation." In his Sixty-second annual report, 1898. Lansing, Robert Smith Printing Co., 1899. 109 pp. At end of report, pt. 3; also separately published.
Free textbooks in Michigan, pp. 18–51. Other States, pp. 61–64. Textbook prices, pp. 65–109.

MINISH, M. P. "New Way of Vitalizing the Study of History in Schools." Cur. Opinion, Vol. 62: 242, Apr., 1917.

MONOHAN, A. C. "Free Textbooks and State Uniformity." U. S. Bur. Educ. Bulletin, 1915; No. 36.

Nebraska. State Superintendent of Public Instruction. "Nebraska's Free Textbook Law." In his Nineteenth biennial report, 1905–07. Fremont, Nebr., Hammond Printing Company. pp. 81–91.

New York (State). Department of Efficiency and Economy. Report of investigation of the cost of providing free textbooks in the public schools of the State of New York, 1914. Albany; Lyon, 1915.

Ontario. Textbook commission. Report. Toronto, Cameron; 1907.

PULSIFER, WILLIAM E. "An Argument against State Publication." (New York, 1914.)

ROBINSON, L. N. "Textbooks in Economics." Sch. and Soc., Vol. 4: 990–3; Dec. 30, 1916.

Russell Sage Foundation. Division of education. "Textbook Legislation. In *A comparative study of public-school systems in the forty-eight states*. New York City (1912). pp. 28–9. (Pub. No. 124.)

St. Louis, Mo., Board of Education. "Free Books and Stationery." In its Annual report, 1905, pp. 241–50.

"State Uniformity in high school textbooks." Jour. of Educ., Vol. 82: 119, 20; Aug. 19, 1915.

"State Distribution of Textbooks." Nation, 98: 73, Jan. 22, 1914.

"Textbook and Supplies." U. S. Bur. of Educ. Bulletin 1910, No. 2; 162–70.

TOWNSEND, E. J. "The Textbook Question." Education, 11: 556–65; May, 1891.

"Waking up the Class: using the 'Literary Digest' in class work." Lit. Digest, Vol. 54: 254; Feb. 3, 1917.

WATERMAN, S. D. "The advantages and disadvantages of a free textbook system." Western Jour. of Educ., Vol. 8: 362–6; May, 1903.

Digitized by Google

WINSHIP, A. E. "Textbooks — educational, commercial, and political." Jour. of Educ., Vol. 81: 285–8; March 18, 1915. (Also in Amer. School, Vol. 1: 69–71; Mar. 1915.)

Wisconsin. Legislature. Special textbook committee. Report, 1911. Submitted to the legislature, 1913. 66 pp.

WYER, J. S., JR. "Textbooks and some others." Jour. of Educ., Vol. 80: 427–8; Nov. 5, 1914.

See American School Board Journal, "Textbook news," each issue, for latest information.

TASH, THOMAS. "Free Textbooks for Free Schools." N. E. A. Proceedings, 1888; pp. 220–5.

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CHAPTER IV

THE SELECTION AND JUDGING OF TEXTBOOKS

Selection of Textbooks, the Business of Experts. For many years it has been a popular principle of school administration that anybody at all interested in the public schools ought to be able to select textbooks for the various grades and subjects. There are parents who sometimes vehemently insist upon a certain book being adopted for the quite natural reason that it is cheap. School boards, whose members one may assume are well informed in their major fields of activity, frequently regard themselves as experts in such matters as the selection of teachers and textbooks, refusing to delegate such expert service to the superintendent and to teachers, who are the logical experts in these paramount issues of instruction. The selection of textbooks is just as technical a problem as the choice of tools for efficient work in any industry. Now and then, of course, there are laymen whose opinions on teachers and textbooks deserve careful consideration, just as one meets a layman who can hit upon good tools for his amateur homecrafts. But, as a rule, the layman depends upon the advice of the bookman who is expected to know the selling points of his books and wherein his goods are better than those of a competitor. Consequently, the supplying of books for the millions of boys and girls in our schools only too frequently is a purely business proposition, where

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the salesman's personality and shrewdness determine the educational policy of a school system.

The Bookman, a Valuable Servant of Education. The bookman, however, very often renders invaluable service in pointing out and exploiting the aims and methods of the author whose textbook he is trying to sell. In the beginning the author and the publisher were both printers and salesmen, but as business increased it became necessary to employ salesmen to market the books. The bookmen have become experts in their various lines, and in many instances are conscientious students not only of current demands but of the more technical development of the various subjects. By introducing the teacher and school officials to new and greatly improved texts the bookman helps to accelerate the progress of educational methods. Without the bookman's analysis of his texts many books would never be examined, for school administrators are busy people. They do not have time to read many books. They welcome sincere help from the bookman. They recognize that he is a salesman; he has goods to sell, and his house expects him to multiply big orders and to get long adoptions. This is business, and without its methods there doubtless would be little progress in any field.

But the school administrator who is honest in his purpose has no patience with a bookman who spends a half hour and more merely tearing to pieces a competitor's books. In most books there are strong and weak qualities. The perfect text does not exist. The *standard* bookman must be well informed in his own field. If he sells algebras, he ought to know the subject itself. He may have some one in the teaching profession compose a "Selling Talk," but it would be better if he made a careful analysis of his own and of his competitors'

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books so as to make it definite wherein his books are really better than those of his competitor. The fair attitude for a salesman to take is that "our competitors' books are good, but we have sought to improve on them, to include the results of most recent scholarship in this subject; and here is what we offer. These are the improvements." The educator will easily agree if the new book does present, very evidently, superior features.

"When suitable opportunity to meet teachers and superintendents is given bookmen, only good can come from their visits. It is a maxim among bookmen that the busiest, ablest, and most prominent school officials and teachers are always the easiest to see. It is so rare when a bookman is denied an interview or prevented from prosecuting his missionary work, that such occasions are a negligible quantity. An insistent, ill-mannered individual may, it is true, place himself outside the pale of even the generous courtesy of the school world. Of course, there are some narrow-minded, self-centered, all-knowing school officials who look upon the bookman as an unnecessary evil. Such men are rare; such attitude being reflected in their school activities elsewhere usually brings about severe criticism. Trade, commerce, and science are interwoven together. Nothing is more anomalous, illogical, and unjust than antagonism between publishers, bookmen, and teachers. There should be complete sympathy, understanding, and concert between them. The bookman should express this policy in his actions at all times. Courteous, respectful, but not apologetic, anxious to perform his principal duty as salesman, reasonably jealous of the ethics and responsibilities of his profession, but conscious that he is a factor in the cause of education — such is the acceptable bookman. To my mind, therefore, the bookman belongs properly in the system of education. He has a necessary function to perform. He will perform that

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function until other parts of the system develop, so that the work performed by him can be better performed by them. Then, in accordance with the law of progress he will pass away. Until that time it is to be hoped that he will live his life with the agencies for good in the schools, and do his part towards reducing the number of his shortcomings, that thereby the efficiency and well-being of the schools may be increased."

The bookman, furthermore, through his travels is frequently able to find authors for improved texts. In this way he may stimulate teachers to creative effort and to wide influence, not to mention large bank accounts. He is frequently called upon for advice by the publisher, for the bookman knows, by observation, how his firm's books stand the wear and tear of daily usage.

Methods of Adoption. It is needless to add that there are numerous exceptions to the foregoing conditions. State book adoption, while only too often a source of political graft, is in many instances determined by an invisible group of educators whose opinions have been sought by conscientious members of the textbook committee. Our large city school boards, as a rule, elect a superintendent who is regarded as an expert in school matters, and to whom is delegated the professional responsibility of selecting the teachers and educational equipment for the schools. He in turn knows full well that no one man can be expert in all the branches of school work. Assistant superintendents, directors, supervisors of departments, and teachers are assigned duties properly within their expert knowledge. Upon them, especially the teachers, he depends for a wise choice of school books. The selection of a textbook, even under this systematic arrangement, is no easy task. Much reading, careful comparison, and full and frank

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discussion are needed. Many meetings may be required. Laborious and depressing labor is imperative. But surely this process, democratic and scientific, is far more just to the school children than the choice which depends solely upon a whim or upon the brilliant canvas of a magnetic salesman presenting inferior books to an unscrupulous political "annex" of a corrupt publishing house.[1]

There is no one universally approved method of adopting textbooks. Many, if not all, of the best educators question the wisdom of state adoption, for under this form, it is claimed, the influence of teachers, principal, or superintendent is almost destroyed. In cities and towns the trend is strong to place the responsibility of decision regarding textbooks in the hands of teachers and their superior officers. In Massachusetts a law of over forty years' standing reads:

"Changes may be made in the textbooks used in a town at any time, notice having been given at a previous meeting, and two thirds of the members of the board voting in the affirmative." The superintendent is now required to make recommendations regarding textbooks to the Board of Education.

Bookmen are glad, as a rule, to have their texts read by well-informed teachers rather than to depend upon "the influence of a politician, or upon the relative of some board member's wife, and upon the enthusiasm for a rival's wares, or on someone who belongs to the same college fraternity or went to the same preparatory school."

There are, however, vicious methods more common in the past than now, employed by unscrupulous bookmen without any real knowledge of the merits of a book, but simply eager

[1] See Educational Survey of Wyoming. U. S. Bur. of Educ. Bulletin, 1916; No. 29; p. 56.

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to swell business, to oust a competitor, or to prevent other publishers from becoming competitors. "The bonus system, post-dating of bills, extra discounts, cutting of prices when times are dull, is common enough in all lines of trade. The big bulk of American business is honest. It could not exist otherwise." This does not exclude the possibility of certain kinds of salesmen who have a blunted moral sense, and who interpret making good to mean "put it over," competing with a competitor by base methods often covered up by the attribute "shrewd."

In this connection it is interesting to review an article by Frank A. Fitzpatrick.[1] He says that the errors of bookmen may be grouped under four heads:

1. Discrimination in terms — giving to one place better rates than to another in order to secure business, some phase of the bonus system, etc.

2. Undue activity in the politics of the N. E. A. and State Teachers' Associations.

3. Meddling in the affairs of the school, assisting teachers and superintendents to secure places, the use of political influence in or outside of the schools.

4. Personal criticism of competitors for imagined business gain.

In considering these errors, seriatim, Fitzpatrick confesses that the first is not altogether unavoidable. Personal feelings cannot always be eliminated in business, and publishers are compelled merely to frown upon instances of unethical dealing on the part of a skilled representative. If such errors become too gross, the managers and representatives can make proper changes in conferences. The second criticism

[1] Educational Review, March, 1912.

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has hardly any foundation in fact. Bookmen, of course, attend such meetings. They frequently are members of the association that is in assembly. If they exercise alert attention to what is going on, and at the invitation of superintendents or teachers discuss some of the newest publications, this is merely good business form.

The third criticism is undoubtedly well founded in some instances. Some publishers do attempt to influence school board elections so as to procure political plums in the form of large book adoptions. Getting the ear of the board is of course all essential and wholly legitimate, but when this means bossism in ousting from office or electing to office superintendents and members of school boards or any others with influence in adoptions, one cannot protest vigorously enough against a system so pernicious to the welfare of the school child. For such political maneuvering may mean the prevention of any competition at all. Such a publisher is seeking absolute suzerainty, regardless of whether or not his texts have merit.

The fourth error is admitted and deplored. Perhaps the best apology for its common occurrence is that more of it was done formerly and in much more questionable ways. There is improvement, but when competition is intense and big orders are the stake, desperate measures are likely to be used.

It is only fair to add that in the past many school board members were perfectly willing that certain kinds of publishers should employ flexible business methods. There was a time in practically all branches of business where bribes of various sorts were expected. There has been such reform in this matter that it is now the exception to find prospective customers requiring " special favors " in giving an order. The

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book business of to-day is honest and dignified. The exceptions must not blind us to the prevailing condition. It would be impossible for publishers of textbooks to continue long in their trade if they practiced illegitimate business methods.

When Textbooks Should be Adopted. The prevailing time for the adoption of schoolbooks is toward the end of the school year. The heaviest buying period is in July and August. If the texts were ordered earlier better prices could be obtained and freight delays avoided or greatly reduced. The following announcement from the United States Bureau of Education states the issue very clearly:

Earlier ordering of school textbooks by boards of education offers a fruitful field for saving in war time, according to Henry P. Kendall, of the Plimpton Press, whose statement on the subject has been transmitted to the Bureau of Education of the Department of the Interior. If school boards can arrange to adopt school texts before January first, asserts Mr. Kendall, instead of waiting until the end of the school year in June, a large saving in the schoolbook printing and binding trades will result. Ordering school textbooks earlier in the year will, it is declared, help to regularize employment in the schoolbook trade, making uniform hours of work and rates of pay possible throughout the year. In one plant at the present time the hours of labor so vary between winter and summer, that on a basis of 100 per cent as the flat weekly wage, operators during the summer months, because of overtime, earn about 130 per cent, and during the winter months about 60 per cent. The workers are obliged to work very long hours in the summer time and go without vacations.

Earlier ordering of school books will also conserve human energy, because it will make it possible to run a factory with a minimum number of employees; it will save machinery, because less will be required to produce; and it will save coal in conserving

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the heat, light and power. Furthermore, the efficiency of the plant can be greatly increased where work is uniform in quantity, and the cost of production is much less in a plant where the product is produced more uniformly.

How Texts Begin To Be Written. The textbook usually begins when a teacher organizes a course in a new way. Visitors observe its good qualities and perhaps adopt some of its good points. The teacher or a friend may inform the publisher of the new method, and if he finds it worth careful study he may ask the teacher to submit a description of the method. The teacher soon finds that writing for himself is one thing, and that writing for the publisher is a wholly different matter. In the working and reworking of the copy many details are added, and after much labor the manuscript finally is finished and sent to the publisher. Editors, expert readers, and perhaps special authorities now read the manuscript carefully. It may be accepted and still be far from satisfactory in form. So the manuscript is returned for revisions and again the author and manuscript have tedious hours together. Or the manuscript may be rejected because the author failed to make himself understood, or because his ideas are not approved by the critical readers. Or it may be rejected because its educational theories are far in advance of present demands in school practice. There probably would be little sale of the book under such conditions.

The Selection of Textbooks

In the bewildering multiplication of textbooks every year, and in the din of praises sung by bookmen eager to sell their books, it is important to consider the question: What

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is a good textbook? Wherein is one textbook better than another? The final answer to these questions is not yet ready, but considerable progress has been made toward standardization of textbooks in the various subjects. In this chapter are quoted some of the schemes that have been adopted by practical school people. The standards here set forth may suggest to other teachers and school administrators ways and means of constructing for themselves standards even better and more attainable.

Standards of Judging Textbooks in Cincinnati, Ohio. This plan was prepared by Miss Anne M. Nicholson, expert for the California State Board of Education. It was accepted by the Cincinnati Schoolmasters' Club, and was reproduced recently in the *School Index*, the official exponent of the Cincinnati school system.

1. Preliminary investigation of expiring contracts: to determine local attitude toward the text in use — whether it is satisfactory or unsatisfactory, and in what particulars; (questionnaires and conferences) to determine comparative merit of textbook in use and others on the market; (tabulation of city and state adoptions) to discover texts most in favor; preliminary examination of the seemingly best texts.

2. Result: the need of a new textbook established or denied, the features in demand for the new text discovered.

3. Advertise for bids from publishers and require submission of texts.

4. Investigation by expert readers of the merits of the books submitted. These expert readers should include representatives from the teachers' college, the principals and the active teaching force. Reports should be made on prepared blank forms indicating the standards to be applied.

5. Tabulations of the returns should be in the hands of a

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committee and a report made of the findings to the Superintendent.

6. The report of this committee should be referred to the textbook committee of the Board of Education, who should have the bids and all financial aspects of the textbook matter in hand.

7. The report of the textbook committee should come before the full board of education for final approval.

STANDARDS FOR TEXTBOOK ADOPTION

A good text should include:

1. *a* — Material whose scholarly nature should be not only unquestioned and endorsed, but apparent.

b — Significant, essential facts, the selection of which is endorsed by a recognized body of experts, including teachers in active service.

c — Such selection and use of material to give such life and color as is organic, and does not tend to obscure essentials.

d — Such treatment of these facts as will leave a unified graphic impression of the whole, so ordered as to be available when needed.

e — Such opening pages as connect with present social needs in as intimate a way as possible.

2. A good textbook should include such organization of essential significant facts as meets the requirements of unity, definiteness, and proportion.

Unity — This may be secured by grouping facts into units interrelated among themselves, and having definite relation to the whole. Captions should indicate these relations.

Definiteness — This may be secured by a statement of the problem or purpose at the outset, an orderly, graphic synopsis at the close of each unit, an emphasis on "milestones" of the subject, and a grasp of the relation to the whole scheme or phase of experience under consideration.

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Proportion — This may be secured by paralleling the units in minimum time allotments (see page 64, New York State Course of Study) by pages of material. This should not be done to the extent of rigidity.

A good text should include graphs, outlines, charts, etc., to enable the pupils to see the relation of the task in hand to what has been accomplished and what remains to be accomplished.

3. *Style* — When containing discourse, a good text should be written in a style that is clear, graphic, colorful, dramatic (when possible), virile, dynamic (where suitable), intimate, attractive, and wholesomely technical when economy and necessity demand.

4. *Appeal to Children* — A good text should possess salient qualities that appeal to children, *e.g.*:

Attractive exterior.

Inviting page arrangement.

Illustrative material (based on action when possible).

"Picturesque" titles of chapters and paragraphs.

Concreteness, picturesqueness, and intimacy of style (rich in incident, intimate in the telling).

Preference for short sentences.

Abundant direct quotations (where possible).

Novelty and resourcefulness in presentation.

Cleverly-planned tasks.

A warp of children's everyday experience.

Opportunity for mastery of definite "units," thereby contributing to the glow of achievement.

Competitive schemes for review.

Visual presentation of abstractions — graphs, etc.

5. *Illustrations* — A good text should include illustrations that tend in size, character, and distribution to indicate the relative importance or significance of the content, *e.g.*:

In history the illustrations should focus attention on men and events of most far-reaching influence.

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A good text should include illustrations that appeal to the interests of children for whom the text is intended.

A good text should include illustrations that in design, color, and composition satisfy the recognized canons of art.

6. *Provision for Teaching* — The teachers' edition should include:

An introduction, giving:

A brief summary of the best pedagogical knowledge of the subject treated: a review of the experimental studies by which these conclusions have been reached.

An evaluated scale to measure ability.

A list of a *few* books immediately bearing upon the subject in hand.

The students' edition should contain:

a. An introduction cleverly planned, intimate in style, to produce a favorable first impression.

b. Points to be noted at the beginning of each chapter or other unit of work.

c. Corresponding enumeration of vital points at the close of the unit.

d. Graphic devices to place the matter in hand in relation to what has preceded and what is to follow.

e. Other interesting cumulative reviews in the form of competitive contests.

f. Exercises to stimulate intellectual interest and reasoning at the close of each unit.

g. Practical applications at frequent intervals.

h. Interesting captions to tasks, *e.g.*: Things to remember, Things to do, Things to read, Things to think about.

i. Stimuli for the imaginative use of the information or skill under acquisition.

Debates, letters of composition, dramatization.

j. Interpretative illustrative material with provisions for studying the same.

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k. A comprehensive index.

l. Pronouncing index, or (better) parenthetical pronunciation of unusual proper names.

7. *Mechanical Make-up.* A good textbook should include a mechanical make-up based upon accepted standards of hygiene, art, design, adaptability to purpose, and upon sound principles of economic production, provided the last named should never be interpreted to mean that an inferior textbook be selected.

Hygiene of Reading. Standards of typography have been evolved from such studies as those of Dearborn, of Huey, and others. The following is a preliminary arrangement of these standards compiled from the above-named sources:

Standards in Page Typography. Length: 25 mm.—Maximum, 90 mm.

Advantages of these standards:

No lateral movement required.

Total motion ½ as much as with longer lines.

More words per fixation.

Favors keeping what has been read.

Eases eyestrain.

Young children need shorter lines than adults.

Height: 1.5 mm. — minimum.

Thickness of vertical stroke: 0.25 — or at most 0.3 mm.

Space within letter between vertical strokes is important, more so than space between letters: 0.3 to 0.5 mm. within; 0.5 to 0.75 between.

Color: black and white is better than any combination for the maximum amount of legibility per unit of space.

Provision for the distinctness of the upper half of the letters hard to distinguish, *e.g.*: c and e; t, i, l; k, h; z, o, s.

Space between words, 2 mm.

Space between lines: 2.5 mm.; of no advantage if the type is undersize.

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Standards for Younger Children:
First year: type 2.6 mm.—leading 4.5 mm.
Second year: type 2 mm. — leading 4 mm.
Third year: type 2 mm. — leading 4 mm.
Fourth year: type 1.8 mm. — leading 3.6 mm.

8. *General Suggestions.* Changes in type, italicization, spacing—all add to getting at the gist of the matter, in that they utilize the indirect retinal field.

There is a distinct advantage in picture printing and the growing utilization of graphic method.

Range of words read per second — 2.5 to 9.8 (Dewey).

Everything that increases legibility by increasing the difference between letters within the prescribed limits not only relieves eye-strain, but frees energy for the work of intelligence.

Illustrations of Some of the Foregoing Principles in Textbook Making. *History.* The foregoing general principles are excellently illustrated in Dickson's *American History for Grammar Schools.*[1]

1. A pupil who reads the opening Foreword is likely to desire intimate knowledge of what the author has to say about the wonderful New World discovered by Columbus. Being very brief and suggestive it may not be amiss to quote it here in full:

Once upon a time, as the storybooks say, a great thing happened in this old world of ours. Perhaps you know already what this great event was, and will tell me that I mean the discovery of America. And if I ask how and when and by whom this discovery was made, perhaps you will be ready to tell me that, too.

But you must remember that so great a thing as the discovery of a new world was not accomplished by one man alone, nor was it

[1] Macmillan, 1913.

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accomplished in the single day when Columbus first saw land after his long voyage. Sometimes we think of it as if a great curtain had been rolled away from before the eyes of Columbus, disclosing the whole continent of America; so that he had only to go home and tell the king of Spain that the New World was discovered.

This is a very wrong idea. We must look back many years before the time of Columbus to find the beginning of the great work, and we must study on to a time many years after his death before we can say that Europe had really found America. Years of toil, great sums of money, the suffering and death of many brave men, were necessary before the work was done. And even then it took centuries more to find what the new continent was like, to settle it with white people, and to make it useful to the world.

It is not one story, but many, that we must read, if we are to know how it all came about. We must read about old Europe and the people there before we can know about America and the new nations that were planted here by European hands.

So let us set out upon our journey, following the white-winged ships on their voyage across the blue waters, from the Old World to the New.

2. At the close of the chapter on "Holiday Happenings" in New Jersey the following directions of study seek to make the pupil's preparation of the material in the chapter definite and also fairly comprehensive. For example:

THINGS TO REMEMBER

1. The American army rapidly decreased in numbers; both soldiers and people were discouraged.

2. Washington led his army across New Jersey, and across the Delaware into Pennsylvania. The British followed to the river, but stopped there for lack of boats.

3. Washington recrossed the river, and attacked Trenton,

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capturing the thousand Hessians stationed there. Cornwallis hastened to Trenton, but Washington by another night retreat escaped, and proceeding to Princeton attacked and defeated two thousand of Cornwallis's men who were setting out to join him.

4. Washington then made his way to the heights of Morristown where he was safe from attack.

The author here gives a simple review, summarizing the salient points in the chapter, setting forth clearly and briefly just those facts that are important for a proper understanding of the next lesson. The child is not allowed to remain confused about these matters. The important points are impressed upon the pupil's mind while he is studying and not after he has appeared in class to recite.

Following this section is an interesting list of reference material:

THINGS TO READ

1. *The Story of the Revolution*, Lodge, pp. 208–27.
2. *George Washington*, Scudder, pp. 156–89.
3. *Hero Tales from American History*, Lodge and Roosevelt, pp. 45–55, etc.

Twelve such references are listed. It should be noted that the pages are given. The pupil is guided economically and definitely in this supplementary reading. The references, moreover, are of such a nature as naturally appeal to children of the upper grades.

Following this set of directions the author supplies definite assignments:

THINGS TO DO

1. Find the meaning of enlistment, daunted, detachments, revelers, carousals, skirmishing parties, reënforcements, leisurely.

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2. Discuss the question: In what way did Washington show himself a great general in this campaign?

3. Prepare yourself to write an answer to the question: What were the results of the New Jersey campaign?

4. Think of words which you might use to describe each of the following persons: Washington, Lee, Howe, Cornwallis.

5. For your portfolio: Leutze's Washington Crossing the Delaware, Ford's Washington at Trenton, Trumbull's Battle of Princeton.

FOR YOUR NOTEBOOK

1. Make a map to illustrate the New Jersey campaign.
2. Make a "running outline" of the campaign.
3. Write the statement for which you prepared in No. 3, above.

At the end of each chapter these sets of directions appear in graded sequence, the author gradually leading the pupil to greater independence, and to more thoughtful studying. The textbook is practically a teacher. In the hands of a well-trained instructor it would become doubly valuable, for author and teacher would very definitely coöperate in guiding the young pupil to a clear understanding not only of each fact but of how these historical data belong to one another. The book is really a story of the development of the United States, a story that children are taught to appreciate.

3. The pictorial illustrations are abundant, but not too numerous. They are in agreement with the text. At the close of the book is a large variety of illustrations of outline forms and also a clear chronological chart of discoveries and explorations.

Vocational Mathematics. An interesting example of correlation in textbook making is furnished by William H. Dooley in his *Vocational Mathematics*.[1] In the chapter on "Measuring

[1] D. C. Heath and Co., 1915.

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Lumber" (Chapter IV) the author gives a clear description of how wood is prepared for building purposes. In a few sentences the pupil is given an easily understood account of how a tree finally reaches the lumber yard where it becomes available for the carpenter. Then follow the necessary definitions, practical problems, and quick methods for measuring boards.

The chapter on "Blanking and Cutting Dies" (Chapter VII) is equally interesting with its account of how dies are made, the process being well illustrated by several photographs and diagrams. Similar correlation is made use of in the section that deals with "Mathematics for Machinists."

One finds that a textbook of this type has gone a long distance beyond the formal and academic variety so common in our schools. The question naturally arises: Cannot every subject be organized along these lines? Why do so few textbook makers fail to sense the need of illustrating their material by real life needs and life facts?

Civic Biology. A striking textbook of the newer type has been written by George W. Hunter. His *Civic Biology*[1] is everything that its title implies. Its frontispiece arrests attention at once. The upper picture shows a crowded street scene in the slums of a large city. Below this is a photograph of a delightful home place in the country. The pictures do their own moralizing. In the discussion on "Plants without Chlorophyll in Their Relation to Man" the author treats "fungi," "fungi of our homes," "the growth of bread mold, etc.," "yeasts in their relation to man" (with several vital subtopics) and "bacteria in their relation to man." The pupil is in touch with life as he is acquainted

[1] The American Book Co., 1914.

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with it, at least as he has seen it without perhaps understanding its deeper significance. Such a book is a guide to a better type of living. The teacher who uses this kind of book should not have much difficulty in awakening and keeping active the attention of every pupil. In fact, attention is secured whenever the pupil feels that the school task concerns his own life. One does not need to construct any scaffolding to build up interest when the pupil senses that the teacher is dealing with topics that are common everyday affairs out there where boys and girls live and dress and play.

Other Standards for Judging Textbooks. As an example of what is being attempted in judging the textbooks in the various subjects the following standards are given as formulated by Superintendent L. L. Forsythe of Ionia, Mich., together with others, who, with him, were studying this problem at Columbia University in the summer of 1915. Like practically all present standards in education it is chiefly suggestive and doubtless wholly tentative, but the interested teacher will find many of its items very helpful.

SUGGESTIVE STANDARDS FOR ARITHMETIC TEXTS

The Forsythe Plan

GENERAL STATEMENT

Textbooks in arithmetic should be judged with reference to the provision which they make for relating the child to the more important quantitative aspects of his life in society.

SPECIFIC STANDARDS

1. Each new phase in arithmetic should be developed as growing out of the interests, experience, and needs of the child.

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The new phase of the subject will thus present itself as a problem or project of interest and value to him and will engage his efforts to master it.

2. Provision should be made for the economical mastery of fundamental facts and processes. To this end the exercise of skill in the motivating of drill work and reviews should be demanded. An author who merely provides a series of exercises has met only the easier demands of his task.

3. Provision should be made for the development of good judgment and clear reasoning power by the solution of problems which will appeal to the child as of value. The following sorts of problems should be considered here (these classes are not to be considered mutually exclusive).

a. Problems of the home, playground, school, and social life.

b. Problems growing out of dramatized life situations.

c. Problems in which the child has to make a choice from among data not all of which are involved in the solution. This is usually the way in which problems are presented in real life.

d. Problems in estimating heights, distances, weights, capacity, etc.

e. Problems in which results are to be approximated, mainly as a check on accurate solutions to follow.

f. Problems which are grouped about a single situation.

g. Problems in which numbers are not involved.

h. Problems with simple numbers which may be solved without the use of a pencil.

4. Provision should be made in primary books especially for enlarging the child's fund of number concepts.

5. Problems, processes, and topics should be excluded from texts when they cease to have a wide sanction in social usage; on the other hand, new topics, new processes, and new types of problems should be admitted to texts only after they have been subjected to this same test.

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6. The emphasis placed on the various phases of arithmetic included in the text should be in proportion to their probable value for the child.

7. Textbooks in arithmetic should be adapted to the children for whom they are chosen.

a. The type, illustrations, and language should be appropriate to the age of the children who will use the books.

b. They should be examined with reference to any peculiar requirements not found in the average community.

c. They should make provision for varying abilities among children of the same grade by the presentation of much easy material, as well as plenty of more difficult matter.

8. Arithmetic texts should proceed by carefully graded steps from the easy to the more difficult, both in matter of processes treated and problems presented.

a. The generally accepted distribution of topics by grades seems likely to persist because of its conformity to this demand and its agreement with important psychological facts.

b. If the modified spiral method is followed in the treatment of certain topics (and it usually is), each successive recurrence to the topic should involve more difficult phases of it and a varied method of attack.

9. Suggestions should be made for much supplementary work growing out of local interests.

10. Provision should be made in the index for ready reference to important facts and topics scattered through the book. The appendix should be used for optional material, data for problems, tables, definitions, etc. These features are of special importance in the more advanced books.

11. The teacher should be permitted some exercise of judgment where more than one course of procedure is possible in the matter of methods; but too many methods of doing the same thing should be discouraged, as confusion is likely to result in the mind of the child.

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12. Illustrations should make a substantial contribution to the work in hand.

13. Textbooks in arithmetic should exemplify the highest standards of mechanical make-up as determined by experts.

Mr. Forsythe devised the score card (Figure III) as a means of recording the valuations of a series of textbooks in arithmetic. Such a card might well be employed by school administrators and kept on file. It is clear, convenient, and definite.

Cincinnati Standards in Arithmetic. Quite recently committees on textbook recommendations in Cincinnati formulated sets of standards in the several subjects where adoptions were being considered. The general committee sent the following note to the several subcommittees:

The general committee in Textbooks is desirous of having an expression from the various subcommittees on the arithmetic texts you have examined.

Without any intention to limit the subcommittees' consideration of the subject, the general committee submits the accompanying outline of points or topics which may be found useful as a guide to a systematic examination of the various texts.

That the work may not be too burdensome, the general committee suggests that you list only the books which, in the judgment of your committee, compose the five best sets or series.

The publishers have been requested by the Superintendent to send samples of their best publications to the Municipal Reference Bureau, City Hall, for your use.

The standards in arithmetic were as follows:

1. Textbooks in arithmetic should be judged with reference to the provision which they make for relating the child to the more

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SCORE CARD							
STANDARDS IN OUTLINE (These should be interpreted by reference to full statement above.)	APPORTIONED VALUE ON BASIS OF 1000 POINTS	TEXTS JUDGED AND VALUES ASSIGNED (Titles to be inserted here)					
1. The problem form of development . .	100						
2. Skillful motivation of drill work and reviews	150						
3. The nature of the thought problems .	250						
4. Provision for enlargement of number concept	25						
5. The exclusion of obsolete material and worth of new material	100						
6. Regard for relative value of topics included							
7. Adaptability to children of the average community .	75						
8. Easy grading of processes and problems	100						
9. Suggestions for work of local interest .	25						
10. Appendix and Index	50						
11. Respect for judgment of the teacher	25						
12. Relevancy of Illustrations	25						
13. Mechanical make-up	25						

FIGURE III

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important number aspects of his life in society. The *problem material* should be made from social, economic, civic, industrial, geographical, and historical data from which the pupils learn valuable information and into which they put a keen interest.

SPECIFIC STANDARDS

2. The *problem form of organization, i.e.* each new phase in arithmetic should be approached and developed as a problem growing out of the interests, experiences, and needs of the child. How can the mastery of this process, formal or concrete, help me, as a pupil, to meet and solve a situation I am interested in?

a. The following sorts of problems: those of the home, playground, school, social, and industrial life.

b. There should be much material from which the child has to make a choice from among data not all of which are involved in the solution of the problem.

c. Many problems may at times not involve numbers, but may present situations which demand explanation.

3. The following material and processes are considered *obsolete* and are largely *eliminated* by most texts and courses of study of the last ten years:

a. The horizontal placing of numbers in the various processes.

b. The old form of placing the quotient in division, with the old continued method of pointing off in division of decimals.

c. Greatest common divisor and least common multiple.

d. Unreal, simple and complex fractions.

e. Reduction in denominate numbers of more than three places.

f. Rules and explanations for processes not to be explained in light of modern authority, as inverting and multiplying in the division of fractions.

g. Formula and rules of methods in percentage.

h. Troy and Apothecaries' Weight.

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i. Longitude and Time with more than 15 degrees unit.
j. True Discount.
k. Partial Payments.
l. Annual and Compound Interest.
m. Foreign Exchange.
n. Equation of Payments.
o. Cube Root.
p. Topical plan of arrangement.

4. *Children's interests* and activity should be provided for in the way of number games, construction work, etc. Work in the fundamentals should grow out of such material.

5. *Pictorial aids.* Illustrative pictures; diagrams, tables, graphs; devices should be numerous.

6. *Excellence of drill.* Frequency. A large factor is the amount of *motivated* drill work.

7. Provision for *individual differences* of pupils. There is a growing need for this. There should be a minimum for all; but provision should also be made for additional work for brighter pupils.

Klapper's Standards in Arithmetic. An excellent statement of the qualities of a good textbook in arithmetic is given by Klapper.[1] (1) The text must first of all be graded so that its language, forms of exercises, explanations, and definitions may be suited to the progressive stages of the course. No one book can adequately supply this need. The bulky *Complete Arithmetic* must be replaced by a series of books, each book covering the work of a grade. (2) A satisfactory text in arithmetic is rich with a variety of well-graded exercises and forms of application. It is quite impossible for the teacher to find time to make such collections of exercises. The author of the text is expected to make the book practical along these

[1] *Teaching of Arithmetic.* D. Appleton Co., 1916; p. 68–70.

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lines. (3) These exercises must be adapted to the needs of changing localities. No one text can be comprehensive enough to meet all the needs that may arise. Consequently standard texts are adapted to local conditions. (4) The problems must also be designed for both oral and written solution. (5) It probably is best to furnish the pupils with answers to the problems. These answers help him to check his work and to test its accuracy. The answer stimulates effort and may serve to evolve a mode of solving the problem. (6) A good textbook in arithmetic, furthermore, gives clear and simple explanatory statements of new matters, diagrammatic illustrations of quantitative relations, a complete index, and such additional directions as will help the pupil to help himself.

Smith's Standards. Writing on this subject, David Eugene Smith [1] says that the kind of textbook which the world has found most usable, and probably rightly so, is that which possesses these elements: (1) A sequence of propositions which is not only logical, but psychological; not merely one which will work theoretically, but one in which the arrangement is adapted to the mind of the pupil; (2) exactness of statement, avoiding such slipshod expressions as, "A circle is a polygon of an infinite number of sides," "Similar figures are those with proportional sides and equal angles," without other explanation; (3) proofs given in a form which shall be a model of excellence for the pupil to pattern after; (4) abundant exercises from the beginning, with practical suggestions as to methods of attacking them; (5) propædeutic work in the form of questions or exercises, inserted long enough before the propositions concerned to demand thought; that is, not immediately preceding the author's proof.

[1] *The Teaching of Elementary Mathematics.* Macmillan, 1903.

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Geometry. — A series of considerations relative to determining merits of textbooks in geometry have been offered by David Eugene Smith.[1] He writes:

It becomes necessary in weighing the merits of a textbook to consider:

1. If the number of proved propositions is reduced to a safe minimum;
2. If there is reasonable opportunity to apply the theory, the actual applications coming best, however, from the teacher as an outside interest;
3. If there is an abundance of material in the way of simple exercises, since such material is not so readily given by the teacher as the seemingly local applications of the propositions to outdoor measurements;
4. If the book gives a reasonable amount of introductory work in the use of simple and inexpensive instruments, not at that time emphasizing the formal side of the subject;
5. If there is afforded some opportunity to see the recreative side of the subject, and to know a little of the story of geometry as it has developed from ancient to modern times.

He quotes from Proclus as follows:

It is essential that such treatise should be rid of everything superfluous, for the superfluous is an obstacle to the acquisition of knowledge; it should select everything that embraces the subject, brings it to a focus, for this is of the highest service to science; it must have great regard both to clearness and to conciseness, for their opposites trouble our understanding; it must aim to generalize its theorems, for the division of knowledge into small elements renders it difficult of comprehension.

[1] *The Teaching of Geometry.* Ginn, 1911, p. 71.

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The entire Chapter VII in Smith's book deserves careful study by teachers of geometry. Examples of recent texts in Geometry are given at the close of Chapter IX.

Illustrations of Modern Texts in Arithmetic. Among the several texts that apply many of the foregoing principles are the books of the Walsh-Suzzallo series.[1] The books are well graded, and have an abundance of "real" problems. A striking feature of these books is the "boxing in" of explanatory material or *model* examples, a device that eliminates visual confusion. The pages are attractive in type composition. The least attractive part of the series is the color of the covers. One gets the impression that the book is unduly cheap looking. No answers are provided.

The *Gilbert Arithmetics*[2] contain a large selection of practical exercises. The printing is clear but the page seems crowded. A unique feature of the series is the summary at the end of each chapter, given in outline form. Valuable examples of mechanical drawing are given in the chapter on denominate numbers.

Texts in General Mathematics. Nowhere is the tendency to break away from traditional program-making so well illustrated as in the organization of general courses in mathematics and in science. More texts seem to have appeared in general science than in general mathematics. Teachers in these fields are not universally convinced that the new courses based on correlation and careful evaluation of material will prove as effective as what appears to be the more thoroughgoing procedure of the traditional organizations of courses in these fields. There are many teachers, however, who are definitely committed to the newer type of courses. Educa-

[1] D. C. Heath & Co., 1914. [2] Macmillan, 1913.

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tional psychology and economic considerations provide abundant reasons for the development of traditional high school mathematics and science into the organizations now being tested. In this connection it is worth while to remind ourselves that one of the fundamental weaknesses of our present type of program of study on every level of the school system, including the college, is the lack of coördination or correlation between the several courses, wherever such correlation is manifestly patent. Any attempt to unify educational material deserves the cordial attention of every teacher concerned.

Perhaps the most notable scheme of correlation in the field of mathematics is that evolved by Ernest R. Breslich. His three volumes on First, Second, and Third Year mathematics, respectively, demonstrate the possibilities and advantages of the new conception of teaching this large subject. There is at least unconscious assent among bookmen to the truth that the ideal textbook must be the coöperative work of individuals who are subject experts, and who are well trained in the psychology of the learning process and in the application of the principles that properly control the learning of a subject. To write a textbook wholly from the standpoint of the logical analysis of the subject-matter may produce a very learned and comprehensive treatment of the subject, but, on the other hand, this very mode of textbook construction may be wholly unsuitable for the arousing of interest, for the prevention of unnecessary difficulties and confusion, and for the development of a mathematical consciousness that leads to a continuous and well-motivated pursuit of this subject.

The pupil in the high school is naturally prejudiced against mathematics. It is needlessly difficult, because it is vaguely

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presented and rigorously developed in its segregated forms. Algebra is wholly isolated from geometry and the teacher in neither course makes use of the large amount of related material at his disposal. Consequently the pupil's early knowledge of mathematics is narrow, confused, bookishly abstract, and formal. One need not wonder over the antagonism that has been quickened by this type of education.

Mr. Breslich has succeeded in organizing a general mathematics course that is both psychological and administratively practicable. He has had the pupil very clearly in mind in each course. There are numerous directions for studying the various units of the subject. Model solutions are copious, but at the same time well-motivated provisions for independent studying abound in the three volumes. Photographs of various kinds of construction work are introduced as illustrations of the practical value of geometry. The many exercises are astonishingly real; they touch life at almost every point. Their abundance and variety make citations difficult. The following may serve to illustrate how Mr. Breslich has kept the high school pupil in mind:

The length of the school hall is l feet. I go through the hall 6 times on Monday, 8 times on Tuesday, 4 times on Wednesday, 6 times on Thursday, and 10 times on Friday. How many feet do I travel along the hall during the week? (*First Year Mathematics*,[1] p. 25.)

The running track in the playground is y yards. While in training, I run around it 6 times on Monday, 8 times on Tuesday, 10 times on Wednesday, 12 times on Thursday, and 14 times on Friday. How many yards do I run during the week? (*Ibid.*)

At noon a thermometer read 3° below 0°. In the evening it

[1] The Chicago Press.

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was 8° warmer. How many degrees did the thermometer read in the evening? (*Ibid.*, p. 185.)

A boy wishes to know how far it is from the shore of a lake at A to an island, B, Fig. 122 at C, 20 yd. from A on the line BA. He lays off $CD \perp CB$ and $CD = 60$ rods. At A he constructs a line perpendicular to AB meeting DB at E. By measuring he finds $AE = 50$ rods. Find the required distance. (*Second Year Mathematics*, p. 113.)

A contractor needs 40,500 bricks for a building. His experience has shown that usually 3.5 per cent are spoiled. How many bricks must he order? (*Ibid.*, p. 215.)

The size of a man's hat is indicated by the number of inches in the diameter of a circle of length equal to the distance measured around the head where his hat rests. What size of hat does a man need, the distance around whose head is $22\frac{3}{4}$ inches? (*Ibid.*, p. 298.)

A trunk 30 in. long is just large enough to permit an umbrella 36 in. long to lie diagonally on the bottom. How much must the length of the trunk be increased if it is to accommodate, diagonally, a gun 4 in. longer than the umbrella? (*Third Year Mathematics*, p. 83.)

Originally the great pyramid of Cheops was 480 ft. 9 in. high and the side of the square base was 764 ft. long. Owing to the removal of coating the measurements are now 746 ft. and 460 ft. respectively. How much stone has been removed? (*Ibid.*, p. 289.)

Among the other attractive features of these books are the summaries at the close of the chapters, a study device that has obvious advantages. Historical notes, portraits of famous mathematicians, and brief biographical sketches lend ornamentation and human interest to the course. The last chapter of *Third Year Mathematics* is a syllabus of all the theorems of plane and solid geometry studied in the first two years. By this provision the pupil finds reference material and direction in reviewing.

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Qualities of Textbooks in Chemistry and Physics. In writing on the principles governing instruction in these subjects Smith and Hall [1] write that the book should give a plain account of the subject without too much pedagogical pretense. It should be accurate in its statements and present a view of science as closely approximating that of the scientist as may be possible in an elementary course. The common elements and not too many compounds should be studied. Works of reference should be consulted. The spirit of the book should be inductive, the laws really forming summaries of facts which have been considered. Theories must find their place as related to facts and should follow, not precede, the study of the facts. The general treatment should be connected, logical, lucid, making evident the unity of the subject.

General chemistry should be treated as a pure science, and not as an arrangement introducing analysis. Formulæ should be kept in their proper places and shown to be receptacles for the results of the study of each action. They are not to be considered as ends of the subject. Careful explanations should be made as to how facts are translated into formulæ.

In general it may be said regarding all textbooks in scientific subjects that they should be carefully evaluated according to the capacities and needs of the various grades in the school. This means that only basal material should be considered. Confusion of many details should correspondingly be avoided. Many technical names are equally undesirable. Illustrations should deal with practical applications as far as possible. Problems should introduce the pupil to his own community,

[1] *The Teaching of Chemistry and Physics.* Longmans, 1904, p. 185.

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and then to a wider range of interests, care being taken, however, not to overemphasize home application.

Geography Standards in Cincinnati. The committee on textbooks in Cincinnati composed the following standards for books on geography:

1. *Quality of Home Geography material.* More remote geographical ideas and concepts are based upon immediate experience. Rich descriptions of how peoples struggle for the necessities of life and of their everyday industry and intercourse should make definitional geography purely secondary. Land and water physical features should be treated from the standpoint of their effects on man's life.

2. *Up-to-dateness of data.* Statistical data, political and production maps and charts should be recent and clear.

3. *Fullness of type study.* Typical industrial activities of sections, rich descriptive matter, used as a means to an end for holding pupils' interest and fixing the necessary place location facts, should characterize geographical textbooks.

4. *Good habits of study.* These should be provided for by
   - *a.* Directions in how to study, together with real problem topics, questions, and suggestions.
   - *b.* Good organization of subject-matter, matter of appealing interest to children and not disconnected facts that might appeal to the more adult mind.
   - *c.* Closely associated matter so that there is a natural progress from lesson to lesson.
   - *d.* Frequent reviews and comparisons with our own country.

5. *Well-graded material.* Is there a proper division of material, as to kind and quantity, between primary and advanced books, with new material for each grade?

6. *Life consequences.* A study of earth conditions as they affect man in his social, political, and economic life is the real mission of geography.

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Standards for Readers. The bewildering number of publications in this field makes the selection of a suitable series all the more complex. The following standards recently used in Cincinnati and in Decatur suggest valuable modes of procedure.

I. CONTENT

1. Thought
   - *a.* Rich in variety.
   - *b.* Arranged in series; seasonal, social, ethical, civic, etc.
   - *c.* Adapted to needs of pupil and community.
   - *d.* Literary style and quality.
   - *e.* Well-arranged and systematic development of phonics.
2. Form
   - *a.* Vocabulary arranged to secure sufficient repetition yet without sacrifice of thought.
   - *b.* Vocabulary well graded — Within each book. / Within each series.
   - *c.* Paragraphing.

II. MECHANICAL MAKE-UP

1. Binding
   - *a.* Durability.
   - *b.* Attractiveness.
   - *c.* Paper — Quality. / Gloss — lacking.
2. Type
   - *a.* Size.
   - *b.* Clearness.
   - *c.* Width of leading.
3. Lines
   - *a.* Arrangement of lines, so that natural word groups are not broken.
4. Illustrations
   - *a.* At top or bottom, or on separate page.
   - *b.* Attractive, clear, simple, and full of action.
   - *c.* Educative and suitable for grades.

In Decatur, Illinois, the following sets of standards were employed in 1915 in judging readers.

CHARACTER OF CONTENTS

1. Provision for variety of motive.
2. Provision for organization of ideas.

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3. Provision for discovery of relative values.
4. Provision for initiative by pupils.
5. Gradation in regard to interests and experiences of pupils.
6. Does content afford opportunities for different children to find some relation to their own peculiar interest or experiences?
7. Can the children enter into the atmosphere of the stories?
8. Does the subject-matter appeal to the child's love, humor, imagination, activity, reason?
9. Do the lessons furnish a stimulus to further thought?
10. Does the text help in forming a foundation for the appreciation of literature?
11. Does the text carry a sustained interest?
12. Does the text have some material adapted for special days, dramatizations, and varied types of reading?
13. Is there opportunity for varied and natural expression?
14. Are the lessons isolated, grouped, or continuous?
15. Will the text tend to produce eager, independent readers?
16. How many pages are not adapted for use by all the children?

VOCABULARY

1. Gradation in regard to work difficulty, sentence structure, mechanical arrangement on page.
2. Are the lessons of suitable length?
3. Are the words, phrases, and sentences of the first half of the primer easy and natural for the beginners?
4. Are the words used in the text those needed in the child's everyday vocabulary, and in reading supplementary readers?
5. Can new words be mastered largely through the context?
6. Does the reading matter lend itself to word grouping?
7. Does the vocabulary increase slowly enough?
8. Does the text sufficiently increase the child's vocabulary?
9. Is provision made for motivated reviews?
10. Is repetition provided at ever-increasing intervals?

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11. Is there sufficiently frequent repetition of words in different relations to each other to assure recognition?

12. Is there too much repetition so that memory is depended upon rather than word recognition?

13. Is the material so organized that a thorough phonic course may be formed leading to independent reading?

14. Does the text tend to strong word mastery?

METHOD HELPS

1. Is there a gradual progression through the series?

2. Is the teacher helped to grow in ability to get intelligent expressive reading from the classes?

3. What suggestions are made for helping the pupil when he does not know the needed word?

4. Which makes the best provisions for drills?

5. Does the subject-matter lend itself to good habits of study?

6. Is there enough material for independent seat work?

7. Can the inexperienced teacher get good results from the use of this text?

8. Does the text open opportunities for growth in method to the experienced teacher?

9. Is adequate help given the second- and third-grade teachers?

10. What provision is made for voice training?

MAKE-UP OF THE BOOK

1. Is the book attractive?

2. Will it stand the wear and tear of daily use?

3. Are the illustrations artistic, suggestive, and of educative worth?

4. Are they well arranged?

5. Are the type and page arrangement well adapted to the particular grade for which the book is intended?

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6. Is the book convenient as to size, weight, and flexibility of binding?

Standards in Spelling and Language. *In Phœnixville, Pa.*, under the direction of Superintendent Isaac Doughton, a successful method of selecting textbooks has been employed. The superintendent examined a large number of spellers and then asked the teachers who taught spelling from the third grade up to examine six of the books that seemed to him the best suited to the needs of the pupils. These books were to be arranged in the order of choice as first, second, etc. The books were then scored by the following plan:

For factors of scoring the order was inverted; that is, every choice was scored six points, every second choice, five, and so on to the sixth choice, which was scored one point. In spite of the instruction given to rate every book, some teachers gave only the first, second, and third choice, or rated only four books. In such cases the remaining possible scores were totaled and distributed equally among the books not reported. On account of the centralization of the seventh and eighth grades the score was tabulated separately for the first six grades, and the average rank of the six texts was determined. Then to make the final choice, this average rating was scored in the same way and given a scoring power of two, the rating of the seventh- and eighth-grade teacher was given a scoring power of one and the superintendent's own rating was given a scoring power of two. On the basis of this final score the final rating was determined and the choice made.

Table IV indicates the results of the teachers' judgments in some detail.

The divergence of opinion is accounted for largely by the fact that each teacher was concerned only with the books of

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I. Teachers' Judgments of Spelling Texts

TABLE IV

Choice	Book A		Book B		Book C		Book D		Book E		Book F	
	Times Chosen	Score	Times Chosen	Score	Times Chosen	Score	Times Chosen	Score	Times Chosen	Score	Times Chosen	Score
First			1	6	1	6	6	36			3	18
Second			5	25	2	10	1	5			1	5
Third	1	4	3	12	2	8	2	8	3	12		
Fourth			1	3	4	12	2	6	2	6	2	6
Fifth	5	10			1	2					3	6
Sixth	4	4							5	5	1	1
Extra	1	3.5	1	3.5					1	3.5	1	3.5
Combined Score of Teachers, Grades III–VI		21.5		49.5		38.5		55		26.5		39.5

The left side of each double column indicates the number of teachers who selected the particular book for the particular choice; the right side indicates the score, found by multiplying this number by the "factor." The factors were as follows: First choice, 6; second, 5; third, 4; fourth, 3; fifth, 2; and sixth, 1.

her grade, while the superintendent was interested in the books of all the grades. The other tables give the results in a more summarized form.

II. Combined Tabulation of Scores

TABLE V

	Book A	Book B	Book C	Book D	Book E	Book F
Average Rank of Teachers, Grades III–VI	6	2	3	1	5	4
Rank, Grades VII–VIII	6	5	4	3	2	2
Rank, Supt.	6	3	5	1	4	1

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III. Final Scores: Textbooks

TABLE VI

	Book A	Book B	Book C	Book D	Book E	Book F
Twice Average Score, Grades III to VI	2	10	8	12	4	6
Score, Grades VII to VIII	1	2	3	4	5	6
Twice Supt. Score	2	8	4	12	6	10
Total Score	5	20	15	28	15	22
Final Rank	6	3	4	(1)	5	2

A similar procedure was followed in selecting textbooks in language. Textbook "D" was finally chosen.

Superintendent Doughton finds that this method has several advantages, especially in smaller districts. In the first place every teacher's vote affects the result. (2) The plan is flexible since the scoring ability of each group of teachers and of the superintendent may be made anything one pleases as the size of the groups and the distribution of responsibility may suggest. (3) The final choice is a composite in which every person concerned has had opportunity to influence the results. The superintendent is able to check up his own judgment and that of his teachers in a fairly measurable manner.

The *Cincinnati committee* devised the following standards in spelling and language.

Spelling. 1. The words listed should be those which investigations have shown pupils will need most in their written work at school and after they leave school.

2. Provision should be made for frequent review of words commonly misspelled.

3. Words should be listed so as to economize effort in teaching, *i.e.* grouped as to roots, prefixes, suffixes, etc.

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4. Suggestions to teachers should offer means of presenting words with a strong initial appeal, for analyzing difficulties, for discovering types of errors and for following up spelling difficulties in all written work.

5. Diacritical marks should be used sufficiently to make children self-helpful in consulting the dictionary.

6. Dictation exercises should receive due attention.

Language. 1. Extent to which the text suggests varied motives and touches a variety of children's interests as a basis for oral and written language.

2. Extent to which oral work is made preparatory to written work.

3. Extent to which original story work, letter writing, and conversations prevail in the types of work presented.

4. Extent to which the books develop appreciation of good literature, enrich vocabulary, and improve diction.

5. Extent to which the content arouses and sustains pupils' interest.

6. Extent to which the plan of the books develops correct use of idioms through eye, ear, and voice, forming correct habits from the beginning.

7. Extent to which grammatical forms are made to grow out of immediate needs and are applied to new work.

8. Extent to which formal grammar is reduced to the lowest terms compatible with an explanation of everyday English.[1]

Suggestive Standards for History Texts. WAYLAND[2] outlines a brief scheme for judging history texts. Its points are well selected and if observed should result in a discriminative choice of textbooks in this subject.

[1] Journal of School Administration and Supervision. April, 1918.

[2] How to Teach American History. Macmillan, 1914.

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OUTLINE FOR REVIEWING A TEXTBOOK IN HISTORY

1. Name of author; exact title; name of publisher; place and date of publication.
2. Your acquaintance with the book. Have you used the book as a student or as a teacher, or as both; or have you only given it a hasty reading?
3. The historical veracity of the book. — Is it accurate and fair?
4. Proportion of parts. — Are the topics well selected, and is the emphasis well placed?
5. The literary style. — Is it clear and interesting?
6. Maps and illustrations.
7. Teaching helps, bibliographies, index.
8. General appearance and make-up.
9. Adaptability. — Does it suit your grade or your class?

To these qualifications should be added: clear ideas, simple style, subject-matter so apportioned that the emphasis will be laid on recent history (for texts in modern and in American history), good character sketches, a good treatment of economic and social events, and a list of references that is definite and fairly accessible to the pupil.

HENRY BOURNE [1] mentions several characteristics of a good textbook that emphasize some of the foregoing points. In the first place it should be written by a competent scholar. (2) It must rest upon a close acquaintance with the problem of instruction. (3) It should not be overloaded with many details, although it should be a book of facts, not of ready-made judgments which will prevent the pupil from consulting other books. (4) Its pages should not be sprinkled with dates. A distinction should be made between those which are inserted for the sake of precision and others which

[1] The Teaching of History and Civics. Longmans, 1903; pp. 157–161.

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are to be committed to memory. (5) There must be abundant maps. (6) Instructive illustrations. The artist's drawing, if carefully done, has a certain educational value. If a portrait of an individual is used, that which represents him at the time when his career is most interesting to history should be chosen. Many of the pictures of historical characters were taken at an advanced age whereas they were young when engaged in historical events. (7) A few genealogical tables.

Illustrations of history texts will be found in subsequent chapters.

Textbooks in Foreign Language. The current antagonism toward the dominant rôle played by Latin in the high schools and colleges of our country is not altogether the traditional opposition of the practical toward the cultural in education. There are many opponents of Latin, as it is frequently taught, who sincerely believe that this subject has educational value and a cultural purpose sufficiently large to justify almost any student in devoting at least two years to its study. The main criticism, aside from that directed against the amount of time demanded for Latin by its teachers, concerns the technic of teaching it. And this objection includes a criticism of a certain type of Latin texts. A glance through two of these books, selected quite at random, will indicate their laudable and less praiseworthy features.

The first is Cæsar's *Gallic War, Books I–IV*.[1] Little need be said about the mechanical aspect of the book. The printing is clear, neat, and adequately differentiated to set forth special points for study. The volume consists of two parts, the first dealing with Books I and II, which are to be studied

[1] Ernst Riess and Arthur L. James. American Book Co., 1914.

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in detail. The second part includes Books III and IV, arranged for sight reading. At the end of the first part are elaborate notes, a grammatical summary dealing especially with points occurring in the text, a word list, and exercises in prose composition. Part Two is also supplied with notes, but these are given at the bottom of each page so that the pupil, while reading at sight, may have ready reference to the helpful suggestions in these notes. At the close of the whole text are a brief discussion of word formation, an index of proper names, and the usual vocabularies. At convenient intervals and as illustrations of descriptions of battle formation are colored diagrams and maps, artistic in appearance and effective for a correct visualizing of the scenes described in the contents.

The Introduction has a valuable essay on Cæsar and the Roman army, with helpful illustrations.

One looks in vain, however, for any statement of the educational value of the book. The pupil is not told why he is invited to labor over the war correspondence of Cæsar. The book supplies in brief sentence form a descriptive heading in English of the several sections, but nowhere do the authors give a summary in outline form of the contents. The pupil will translate haltingly and in wretched English, and at the close will have probably only a very confused understanding of what all this strange jumble of words really means. One may well question the genuine educational value of such procedure. So far as the author is aware there is no text in Cæsar that provides at the beginning of each book a well-written summary of the contents. Such a translation (free and beautiful) would give the pupil a background for his own translation. A summary of this sort would not

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unduly facilitate translation, for word and sentence structure still require adequate rendering into English. After the pupil has been painstakingly accurate, and even while he is analyzing the various paragraphs, he should be conscious of a general meaning that will sustain interest and properly facilitate the understanding of what he reads. The Summary would provide this needful background.

Excellent as are the maps it would add to their interest for the pupil if in colored outline Gallic territory as it is to-day, with English equivalents, appeared on each map. Some of this material is given in the notes.

The text would have additional value if at the close of each book the authors gave a list of suggestions for study, including review questions that would clinch the meaning of the various passages, make clearer the images of the scenes described, and more easily recall the several points of interest emphasized by Cæsar. Such directions for study would really illumine the course and make its progress cultural and also practical in the best sense of this word.

In Virgil's *Æneid*[1] there is a quite different approach. The authors' preface quickly wins interest for the book and seldom does one find an Introduction so satisfying as the one in this text. After several pages devoted to an account of Virgil's life and works, there is a carefully written essay on the literary value of the *Æneid*, an analysis of each of the six books, and a study of the character and personality of Æneas. Extracts from syntax, rhetoric, and prosody are also given. The authors show a sweet reasonableness in giving a translation of the first thirty-three lines. This is done because these verses are generally considered the most dif-

[1] H. R. Fairclough and Selden Brown. Benjamin H. Sanborn & Co., 1914.

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ficult for the pupil to translate. Tennyson's tribute to Virgil closes the Introduction.

If the teacher gives faithful attention to this preliminary material in one or two assignments through the medium of a Lesson in Appreciation, the pupil will doubtless approach the more technical work of the course with considerable enthusiasm. His studying, moreover, will be definite, for the authors give notes and questions at the close of each book, suggestions that form excellent means of reviewing and enriching the several units of the course.

An outline of each book with the place occupied by each character, diagrams of the plot, and references to the influence of the various books on English literature would indicate how the course might be correlated with English literature and history.

Various Standards Summarized. A Suggestive Summary of qualities of good textbooks in a variety of subjects is made by T. Raymont:[1]

A good teacher of younger scholars will usually select that textbook of arithmetic or algebra which consists simply of a copious, varied, and systematic series of exercises. He will prefer that all explanatory and demonstrative matter should form the subject of oral lessons, he will help his pupils to make their own summaries of facts and principles, and he will resent any division into "lessons" as an unwarrantable intrusion upon the individual teacher's province. The exercises should be sufficient not only for a first course, but also for subsequent revision; the book will not be worked straight through, as if it were a story book, but the teacher will pick out such samples as will best serve his purpose at the time. In short, the book will be the teacher's servant, not his master.

[1] Principles of Education. Longmans, Green and Co., 1913, pp. 272, 273.

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The choice of a textbook in geometry will, of course, depend, in the first instance, upon the teacher's special views as to the content and sequence of the course; but he will in any case require that the figures be bold and well-drawn, that the steps of the proof be clearly arranged, and that due limits be placed upon abbreviations of geometrical language. Here again he will be satisfied with the usual systematic arrangement. Though he will not require all the axioms and definitions to be swallowed at the outset, he will not object to their being neatly brought together, to be referred to as occasion arises.

The one indispensable textbook of geography is, for beginners, a collection of pictures, and for older pupils, a collection of diagrams and maps, which should not be crowded with unnecessary names, and should be printed with merciful regard to the scholar's eyesight. . . . Similarly the best supplement to a course of lessons in history is a "skeleton outline" of the chief events, chronologically arranged, and so forming a temporal scheme which shall aid the memory and be on hand for reference. For the rest, the teacher of geography and history will prefer to rely on his own powers of description and narration, and on the contents of the school library.

In the teaching of natural science, books will play a still less important part. A brief summary of facts and principles such as might be given in the form of notes, is the utmost that is needed; unless the subject demands the solution of numerical problems, in which case a collection of these may be useful. . . .

A school grammar should make the essentials absolutely clear, and relegate all exceptional formations and constructions to appendices and footnotes. The use of a vocabulary is a convenient stepping stone to that of a dictionary.

Summary. The judging of textbooks is so often a haphazard and ill-defined process that all concerned need to cooperate in constructing standards that will greatly aid the

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judge in this important matter. Generally speaking, a textbook should be well and clearly printed, *i.e.* printed in accord with the needs of the stage of development, physically and mentally, of school children. It should be mechanically attractive and effective both in illustrations, binding, and general arrangement of the contents. The material should be graded, new words carefully defined on the page where they occur, statements made accurately, and the literary style simple and direct so that the pupils can easily understand them. Rules and exceptions should be printed in different type.

QUESTIONS AND PROBLEMS

1. How are textbooks and supplementary books adopted in your school system?

2. What procedure is followed by individuals assigned the critical examination of proposed texts in your school? Does the teacher have any real responsibility in the selection of texts?

3. How would you improve upon the criteria or standards for judging textbooks, as illustrated in this chapter? What method might be used in constructing standards more objective than those cited in this chapter?

4. To what extent are the criteria used in your school merely conventional, and to what extent are they determined by a careful study of the textbook itself, its organization of subject-matter, its mechanical arrangement, etc.?

5. How do the texts that you now use conform to the standards stated in this chapter?

6. How often are textbooks changed in your school system? Is this often enough? What should determine the frequency of change in textbooks?

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REFERENCES

COCKERELL, T. D. A. "Textbooks and Reviewing." Science. Vol. 34: 561, 2, Oct. 27, 1911.

DEARBORN, W. F. "The Psychology of Reading." Archives of Philosophy, Psychology and Science, No. 4, 1906.

DOCKERY, F. C. "Span of Vision in Reading and the Legibility of Letters." Journal of Educational Psychology. Vol. 1: 123–31.

FITZPATRICK, F. A. "Bookman and the Textbook Problem." N. E. A. Proceedings, 1912. Pp. 449–55.

"Bookman and His Relation to the Textbook Problem." Educational Review. Vol. 43: 282–91; March, 1912.

HUEY, E. B. *The Psychology and Pedagogy of Reading*. Macmillan; 1908.

JESSUP and COFFMAN. *The Supervision of Arithmetic*. Macmillan; 1916; Ch. IX.

"Quality and Cost of Textbooks." Journal of Education. Vol. 81: 681–3; June 24, 1915.

KARAPETOFF, V. "Are Teachers Entitled to Complimentary Desk Copies of Technical Books?" Science. Vol. 35: 452–4; March 22, 1912.

MIDDLETON, G. "Textbook Game and Its Quarry." Bookman. Vol. 33: 141–7; April, 1911.

MONROE, PAUL. Encyclopedia of Education. Vol. V. "Textbooks."

SANDFORD, E. C. "Relative Legibility of the Small Letters." American Journal of Psychology. Vol. I: 402–35.

"Schoolbooks That Ruin the Eyesight." Literary Digest. Vol. 46: 394; Feb. 22, 1913.

"Square Deal." Journal of Education. Vol. 82: 660; Dec. 30, 1915.

STUART, D. C. "One Way of Making Textbooks." Nation. Vol. 90: 428, 9; April 28, 1910.

THWING, C. F. "Improvement of the Textbook." Nation. Vol. 90: 424, 5; April 28, 1910.

WOODWORTH, R. S. "Vision and Localization During Eye-movements." Psychological Bulletin. Vol. 3, No. 2.

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CHAPTER V

THE TEXTBOOK AS A TOOL

The Importance of Knowing One's Tools. It seems to have been tacitly assumed for many centuries that in the studying of abstract subjects the learner possessed as a gift of nature the ability to master the difficulties involved in the courses assigned or elected by him. The mind itself was regarded as a tool and the individual somehow knew by the gift of the gods just how this tool should be sharpened and handled. This attitude toward the educative process resulted in the development of memory as par excellence the method of study, and many volumes throughout the centuries have been written on memory and devices of memorizing. So-called memory schools have arisen, and complicated schemes of mnemonics have been contrived. More recently, however, educators have found it necessary to consider other methods of study and to give them greater significance in the classroom. Memorizing is important and even fundamental in all education, for unless we can retain and recall what has been learned education is a misnomer. But the educative process depends on other factors as well, and one of these is the ability to use the means universally selected for imparting knowledge and developing powers of understanding and thinking.

What the hammer, saw, chisel, needle, scissors, etc., are to manual training and household arts, the textbook is to those courses where knowledge and training depend upon recorded

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information, either entirely or in part. If it is vital to train pupils in the handling of tools in laboratory courses, it is equally essential that similar training be afforded them in the use of the textbook. For the textbook is a tool by means of which knowledge is received and understanding developed. A properly constructed textbook is practically indispensable in formal education. But if it is not wisely used, it results in waste of time and effort, not to mention waste of money.

Locke emphasizes these and other points in his *Conduct of the Understanding*.

There is nothing almost has done more harm to men dedicated to letters than giving the names of study to reading, and making a man of great reading to be the same with a man of great knowledge, or at least to be the title of honor. . . . Books and reading are looked upon to be the great helps of the understanding and instruments of knowledge, as it must be allowed that they are; yet I beg leave to question whether these do not prove an hindrance to many and keep several bookish men from attaining to solid and true knowledge. This I think I may be permitted to say, that there is no part wherein the understanding needs more careful and wary conduct than in the use of books; without which they will prove rather innocent amusements than profitable employments of our time, and bring but small additions to our knowledge.

And in the same connection:

Till we ourselves see it with our own eyes and perceive it by our own understandings, we are as much in the dark and as void of knowledge as before, let us believe any learned author as much as we will.

Aids to Study in Textbooks. The best textbooks are so arranged that under skillful direction the pupil is able to glean

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at least elementary acquaintanceship with the subject. More recent texts contain very definite aids to study. These helps are clearly stated, and the authors have not failed to label their directions as "helps to study." The pupil notes that the author has had him in mind and has not been concerned chiefly or entirely in supplying information about the subject. In using the textbook as a tool three lines of direction are available. The first of these consists of:

I. SUGGESTIONS BY THE AUTHOR

It has already been stated that authors of modern textbooks include directions of study which will facilitate the pupil's grasp of the various assignments. Some of these directions refer to methods of memorizing, physical conditions of study, means of providing concentration, etc. But more definite than these are the other suggestions for study.

The Syllabus. Not infrequently the author supplies his reader with a summary of the contents of the chapter arranged in a series of short sentences or paragraphs that contain the gist of the main points. Stated in this tabloid form the reader has a birdseye view of the chapter and can more readily appreciate the relationship between the several subdivisions appearing in the chapter. Two kinds of arrangement of the syllabus are in vogue.

The syllabus preceding the chapter and forming an introduction to its contents is especially valuable in providing the pupil with a background. If he reads through this syllabus under the teacher's direction, he becomes acquainted with terms and ideas whose restatement and elaboration are somewhat familiar and therefore more easily understood. The

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pupil has been prepared for the new material. He has already seen the new material in its large associations and meaning. In the more detailed study that follows, subdivisions and special points of emphasis will have appeal because they belong to a whole that he has already seen. To use an illustration from aviation, he has flown over the new territory and has seen its boundaries and inner organization. Without this overhead view his progress through the chapter must indeed appear haphazard and puzzling.

Every teacher knows how essential it is in presenting the pupil to strange material that some lines of connection with familiar material be run in order to unify experience and lay foundations for ready comprehension. None of us can grasp wholly strange principles and facts. If, however, we discover in the new something that reminds us of the old, perception and understanding become possible. The skillful teacher will link the new with experience that is personally interesting to each pupil, or with experience that has become his by means of thorough comprehension. The preliminary syllabus, therefore, must be explained in its relationship to what the child already knows, otherwise it is of but little value.

Illustrations of the preliminary syllabus. Various forms of the syllabus preceding the chapter can be found in the more recent textbooks. A good example of the outline type occurs in Towne's *Social Problems*.[1] The chapter on "Conservation of Human Life" is outlined as follows:

I. Safety
   1. General significance
   2. National organization for safety

[1] Macmillan, 1916.

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3. First-aid work
4. Railroad organizations for safety
5. Safety in mines
6. Safety in factories
7. Work of corporations toward safety
8. State control
9. New standards for coroner's office

II. Industrial diseases
1. Definition
2. Prevalence
3. Lines of action necessary
   a. Investigation
   b. Legislation
   c. Education of the public
4. Results of prevention
5. Conclusions

III. Infant mortality
1. Extent
2. Rate compared with other countries
3. Causes
4. Combative measures
5. Public sentiment
6. National Association
7. Signs of progress
8. Children's bureau

IV. Health and Sanitation
1. Diseases classified
2. Length of life
3. Different diseases
   a. Causes
   b. Methods of combating each
4. Needs of the United States
   a. Scientific preventive medicine
   b. Health boards and experts

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c. Coöperation of the people
d. Eugenics
e. Pure food

V. Conclusion

In *A Student's History of Education* by Graves[1] the preliminary syllabus is a well-condensed summary of the chapter. For example, the chapter on "The Scientific Movement and the Curriculum" is introduced by four quintessential paragraphs:

OUTLINE

During the past two centuries a great growth has taken place in the natural sciences. For a long time this development affected the practical life very little, but during the nineteenth century the application of science to industrial problems has resulted in a host of inventions.

Because of the importance of the sciences to life, Spencer and others have urged the inclusion of them in the curricula of schools and colleges. While the content of the sciences has furnished the chief argument for this, many scientists have urged their value as formal discipline.

Instruction in the sciences has gradually been included in the higher and secondary, as well as in the elementary institutions of Germany, France, England, and the United States.

This marked scientific movement is allied with the psychological tendency in its improvement of method, and with the sociological in its emphasis upon human welfare.

A similar arrangement is adopted in *The History of Modern Elementary Education* by S. C. Parker.[2] The syllabus is called "Main Points of the Chapter" and in numerical order gives the essentials of the chapter.

[1] Macmillan, 1916. [2] Ginn and Co., 1912.

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It is not always possible or necessary to provide introductory outlines of the contents of a chapter, but wherever possible such outlines are a valuable aid to the pupil, especially when the teacher discusses the syllabus with the class, the pupils having their books open.

A happy and stimulating introduction, slightly different from the forms considered, but maintaining the necessary elements of a syllabus, is found in Long's *English and American Literature*.[1] Each chapter is headed with an apt poetical quotation, an historical outline, and a paragraph on typical writers or a general critical estimate of the men and works about to be studied. Separated from the main body of the chapter by smaller type and large leading, the introductory material is attractive in appearance as well as helpful in its subject-matter.

More usual is *the summary or syllabus that follows the chapter*. If the kind just considered provides a background, the more usual arrangement supplies a means of review and recall, both of which are indispensable in any field of study. The author of a text regards certain statements in the chapter as especially important, and by means of a syllabus lists those points for the reader's benefit. Some authors use a brief and general summary, but for the beginning pupil itemized résumés are preferable.

The question may arise whether both of these kinds of syllabi might be used in a chapter. The preliminary syllabus would perhaps be more detailed than the other and aim chiefly to give the organization of the material. The review syllabus would not deal with the structure of the contents but rather with such important points as the author deemed pertinent

[1] Ginn and Co., 1917.

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for the understanding of the entire subject treated in the text. The employment of both kinds is, therefore, important.

Illustrations of the summary that follows the chapter. A unique and distinctly valuable form of this type of summary is employed in *Human Behavior* by Colvin and Bagley.[1] For example, at the end of the chapter on "How Instinctive Behavior May Be Changed," the authors summarize the discussion by giving the following "Definitions and Explanations of Terms Used":

Modification of instincts. — Changing the character of an instinctive activity by (1) attaching another feeling and its appropriate response to an object that naturally arouses an undesirable instinct; (2) attaching another response to an object and the feeling that it naturally arouses; (3) or detaching a feeling from its natural object and response, and attaching it to other objects and responses.

Sublimation of instinct. — Modification of the third type described above.

Doctrine of natural punishments. — The theory that the unguided experience of the child will lead to the essential modification of instinctive tendencies.

Ideal. — An idea surcharged with feeling, and thus made an effective end or goal of conduct.

By this means review and recall are promoted more readily than if the pupil were left to do his own summarizing, a task especially difficult in a subject like psychology.

Breslich uses a similar study device in his three volumes on Mathematics, already referred to. A brief citation taken from *Third Year Mathematics* is typical.

[1] Macmillan, 1915.

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SUMMARY

355. The chapter has taught the meaning of the following terms: polyhedral angle, triedral angle, polar spherical triangles.
356. The following theorems have been studied:
(Here follow twenty of the theorems.)
357. The following constructions were taught:
(Three of these are given.)
358. The following formulas have been proved:
(Three of these are described.)

A splendid means of recall is provided in the last chapter of this book, where Breslich gives a "Summary of the Assumptions and Theorems of Geometry Given in the Course of the First and Second Years."

In his *Vocational Mathematics*, Dooley furnishes a "Table of Formulas" with page references which might be used for convenient recall. For example:

Depth of thread of U. S. Standard D Px. 6495 — See page 142

Hessler in his *First Year of Science* [1] arranges the summaries in a manner similar to that in *Human Behavior*, the large amount of material in each chapter, however, necessitating a much longer listing of definitions and explanations.

Special attention should be called to the summaries given by Morgan and Lyman in their text in *Chemistry*.[2] Some of these are given in both tabular and definitional forms. The latter are comprehensive and really give the pupil a terse restatement of what has been elaborated in more detail in the chapter. In this form they indicate what the authors

[1] Benjamin H. Sanborn and Co. 1915. [2] Macmillan. 1913.

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regard as essential. The pupil's accurate and economical reviewing is greatly facilitated by this line of suggestion.

A very effective form of summarizing is used by Black and Davis in their *Practical Physics*.[1] The "Summary of Principles" is printed in black-face type and reviews the important truths and formulas of the chapter. For example:

When a wire cuts lines of force, an induced E. M. F. is set up in the wire.
To get direction of current use the right hand.
Thumb. Motion.
Forefinger. Flux.
Center finger. Direction of Current.
Magnitude of E. M. F. varies as speed × flux × turns.
Slip rings give alternating current.
Commutative give direct current.
Dynamo does not make energy, it transforms mechanical into electric energy.
Motor transforms electrical energy into mechanical energy.

In his three volumes on literature William Long has given careful attention to the summarizing of each period. The subheads of these summaries cover the points indicated by the following: Summary of the Revolutionary Period, Literature, Typical Writers, First American Novels. The details of the chapters are well condensed and coördinated so that the reader obtains in tabloid form a clear impression of the meaning of a particular unit in the development of the course.

Questions and Problems Following Each Chapter. These are of great help in two particulars. They make reviewing convenient, but their chief value lies in stimulating the pupil to apply what he has studied and to think out the solution of the problems suggested by the author, especially if these prob-

[1] Macmillan. 1917.

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lems refer to matters in which the pupil is personally interested. It may be difficult to provide questions for all kinds of interests in a subject, but between the heavy condensation of material that characterizes many textbooks, and the listing of a large number of questions to suit the appeals current in practically every class, it would be better to abandon condensation and to multiply questions. A skillful question will probe much deeper than a condensed treatment. And it should be remembered that where a large number of questions are provided no one pupil should be expected to answer all of them but only those that have personal interest for him, in addition to certain others that everybody should be able to answer in a particular subject.

Illustrations of questions and problems. It is difficult to select any typical illustrations of this phase of textbook making, for the recent texts contain in large numbers excellent material along these lines. One finds in practically every subject textbooks whose questions and problems for study link up with immediate needs and interests. Reference has already been made to some of these in Dickson's *American History for Grammar Grades*, and in several of the texts on mathematics. Among the many excellent facilities for applying the subject-matter of the textbook in wider and more extensive study are the questions formulated by Ashley.[1] The following, at the close of the chapter on "Progress and Problems," are typical:

Place in your notebook a complete summary of the following topics, showing the sections of the text in which details may be obtained: Territorial growth, railway development and control,

[1] *American History*, Revised 1914. Macmillan.

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foreign relations in general, social changes after the (1) Revolutionary War, (2) during the first half of the nineteenth century, (3) during the last half century.

2. What are the chief advantages of economic consolidation? What are the disadvantages of the policy? Why do trusts raise prices if they have no competition?

7. What are the chief problems for the nation to solve? What solutions have been suggested for each?

Mr. Ashley uses three divisions in his questions and problems. For example:

TOPICS

1. Cuba and the United States before 1898: The American Nation, xxi, 171–173; xxv, 3–28; Hart, "American Foreign Policy," pp. 103–13; Latané, "United States and Spanish America," pp. 89–175; Callahan, "Cuba and International Relations," Chadwick.

STUDIES

1. Isolation of the United States before 1897. (Olney, R., in Atlantic Monthly, 8 (1898), pp. 577–588.)

8. Character of the Panama Route. (Burr, W. H., in Scribner's Magazine, 31 (1902), pp. 156–169.)

QUESTIONS

(Reference has already been made to these.)

Robinson[1] uses many stimulating questions, and aids the student by giving the section that covers the ground of the question. For example:

Section 157. Trace the events of the summer of 1914.

[1] *Mediæval and Modern Times.* Ginn and Co., 1916.

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Attention should also be called to the questions in ***How to Teach*** by Strayer and Norsworthy,[1] where the student is directed to think of teaching in the terms of the actual school situation. For example, at the close of the chapter on " The Significance of Individual Differences " the authors ask:

13. Will a boy who has unusual ability in music certainly be superior in all other subjects?

14. Why are children who skip a grade apt to be able to skip again at the end of two or three years?

15. Are you able to distinguish differences in type of mind (or general mental make-up) among the children in your classes? Give illustrations.

16. What changes in school organization would you advocate for the sake of adjusting the teaching done to the varying capacities of children?

17. How should a teacher adjust his work to the individual differences in capacity or in achievement presented by the usual class group?

From the current hostility toward Latin it might seem as though this subject were doomed to the ignominy of serving no clear and vital purpose or interest for the usual pupil. Only rarely does one find that the author of a textbook in either ancient or modern language has tried to provoke real thinking beyond the formal perceptualizing among case endings and problems of locution. And yet one feels that subject-matter in Cæsar and Virgil (not to mention the other texts) is potentially thought-provoking, and that some of these possibilities ought to be suggested to the pupil and to the unawakened teacher by the author. Fairclough and

[1] Macmillan, 1917.

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Brown[1] have succeeded in listing many admirable questions that ought to arouse real studying. For example, among the questions on Book I are these:

What passages show the character of Æneas? What characteristics do you find emphasized? What are the essential qualities of a leader? Does Æneas possess them? (Cite passages to show reasons for your opinion). . . . How does Latin verse differ from English? Describe the meter of the *Æneid*. What English verse-forms are used to translate it? How does Tennyson describe it? . . . Quote five reminiscences of Book I in English writers.

At the close of Book VI are a large number of unusual stimuli to reflection and correlation. Surely the following under the guidance of an enthusiastic and well-informed teacher should keep the pupils alert:

Which of the first six books could be omitted with least injury to the poem as a whole? What do you consider the most beautiful passage in the poem? What effects beneficial to Rome would such a poem be expected to produce? What are the leading ideas animating the poem? . . . Was Virgil a religious poet? . . . Illustrate the spirituality of the *Æneid*. . . . To what Greek and Roman poets was Virgil most indebted? What has been the extent of his influence on European literature in general? On English poetry? . . . Cite six Virgilian expressions which have become proverbial, etc.

Reference has already been made to Towne's *Social Problems*. Each chapter is summarized in a list of review questions that aim to emphasize the discussion as directed by the author. But at the close of the book is a generous supply of supplementary questions whose consideration will quicken

[1] Virgil's *Æneid*. Benjamin H. Sanborn and Co., 1914.

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the pupil's interest in his environment. The questions are grouped under chapter headings to correspond to the arrangement of the text.

In his *American Literature*[1] Dr. Long explains that the Suggestive Questions appended to each chapter "are not to be considered as an examination. They are intended chiefly to stimulate the pupil's thinking, to encourage his independent judgment, and occasionally to lead him away into a field of pleasant research." Such questions as the following are more than formal didactic class exercises.

Of Bradford's *History* the scholarly Senator Hoar said, "I read again and with renewed enthusiasm and delight the noble and touching story." Speaking of his search for the original manuscript he said: "It seemed to me then as it now seems to me, the most precious manuscript on earth." Can you explain or understand his enthusiasm?

Name the five books of the Leatherstocking drama in their natural order. In what respect is *The Pioneers* better than the others? What is the chief interest of *The Last of the Mohicans?* What are the essential differences between the latter story and a dime novel of Indian adventure?

Summaries Throughout the Chapter and at Its Close. Reference has already been made to the current defect of making a textbook too much a condensed compendium of knowledge. This is the danger of exhaustive teaching rather than carefully evaluated direction in the learning of a subject. Obviously, no one text can deal thoroughly with all the aspects of a field of knowledge, and, this being true, much harm may be done in overcrowding the book by condensations that must seem only a mere jumble of words to most if not all pupils.

[1] Ginn and Co., 1913.

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Summaries throughout the chapter should follow carefully evaluated details that are plain and concrete. Each detail is a thread and a turn of the hook. The preliminary syllabus provides the pattern, the reviewing syllabus examines the section thus far completed. But between the pattern and the review are smaller summaries where the pupil ties together what he has just done and observes the meaning of the details on which he has been working. The summary without the detail is well-nigh hopeless, and details without summary lead to confusion and the failure to build up ideas and concepts usable in the final and more complete understanding of the course.

For young pupils it perhaps is unwise to use very general summaries. The itemized syllabus probably is better. But the general summary by the author is not to be neglected entirely. It has great value in suggesting to the pupils how summaries should be made. Some authors employ the summary in the form of definitions of terms that have been considered in more detail throughout the chapter. Others interpret the meaning of what has been discussed in the light of what has been learned in preceding chapters. This might be called a "cumulative summary," and, when studied under the teacher's direction, is doubtless very helpful in the gradual unfolding of the pupil's appreciation and understanding. Such a "cumulative summary" might well run throughout the book in addition to the more detailed syllabi.

Illustrations of intra-textual summaries. Tarr in his *New Physical Geography*[1] makes excellent use of this type of summary. Brief and still comprehensive, these summaries give the gist of each section in a chapter. They are printed in

[1] Macmillan, 1917.

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italics and in blackface type are headed "Summary." In the chapter on "The Ocean" there are twenty of these summaries. At the end of the chapter there is a topical outline that gives the main headings of each section.

References for Additional Reading. Fortunately no well-trained teacher any longer limits himself to one textbook. Especially in these days of the rapid extension of knowledge and the wide diversity of interests is it impossible for one text to contain an exhaustive treatment of any one subject. Authors differ in their point of view and interpretation. Some texts are valuable for one thing and others for another. It is therefore necessary that careful and detailed references be given in each book to similar treatments in books where a more comprehensive discussion is available.

References to additional reading are valuable in stimulating original organization by the pupil. The beginner needs instruction and training in this kind of studying. He learns that the author has depended on information collected by others, and is thereby able to read for himself what the author used. In the lower grades it may be impossible to do much of this supplementary work and perhaps it is unnecessary to require more than an occasional report on such reading. But enough of it should be done by each pupil to acquaint the class as a whole with the broad scope of the subject. Cubberley believes that in every primary room there should be at least ten sets of suitable supplementary readers. "By a system of exchange the same sets might be made to do service in several classrooms within the year." [1]

References by the author are valuable to the teacher in the enrichment of his own point of view. The progressive teacher

[1] *The Portland Survey.* World Book Co., 1916.

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will, therefore, welcome such additional reading because of the light it throws on the briefer form of treatment in the text. Many suggestive illustrations and interesting problems are available by this means.

Illustrations. It perhaps is unnecessary to stress the importance of supplying the text with accurate and interesting illustrations. One picture will mean more than many words. In history and the sciences illustrations are invaluable. Texts on vocational mathematics and even books in ancient and modern languages are improved by the careful selection of pictures that present scenes or photographs of otherwise obscure meanings. The tremendous influence of *Orbis Pictus* by Comenius, the first illustrated textbook, is due to its rich assortment of pictures, each illustration making unmistakably clear what is meant by the corresponding description in sentence form.

But illustrations include more than drawings and photographs. Charts, tables, and diagrams are indispensable, provided they are properly explained by the author. A chart without explanation is practically useless, for it is the author's mode of treating his material and, while making use of certain principles and rules that govern the construction of charts and diagrams and tables, each application of these principles involves the author's own reaction, and therefore requires detailed explanation. When properly constructed such illustrations are of inestimable value in providing clear and accurate perception, without which understanding and application are almost impossible.

Examples of textbook illustrations. In no particular has there been greater improvement in recent textbooks than in the matter of pictorial illustrations. The history texts by

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Ashley, Dickson, Robinson, Harding, and West are unusually beautiful and accurate in their illustrations. Wherever possible half-tones replace wood cuts and imaginative drawings, which, while ornamental, frequently convey wrong impressions. Texts in mathematics are also illustrated by means of half-tones, excellent examples being found in the texts by Breslich, Dooley, and Hawkes-Tuby-Touton.

Language books are similarly made interesting, Fairclough and Brown's *Virgil* being a striking instance. *The First Book in French* by Maloubier and Moore [1] deserves special mention. In this book the student may study, at his leisure, scenes and portraits typical of French life and history. Such pictures as *La Cité et le Pont Neuf*, *Le Bois de Boulogne*, and *Victor Hugo* are altogether satisfying from the standpoint of educational art.

Books in science are vitalized in part by photographs of interesting experiments and of applications of scientific principles as well as of the great scientists. Morgan and Lyman have made their *Chemistry* even more valuable by the numerous page pictures that visualize the verbal descriptions in the text. While less artistic, the pictures in Barber's *First Course in General Science* are to the point and deal with up-to-date subjects. Hessler's are, on the whole, more artistic but not superior to Barber's in directness of appeal. The portraits of eminent scientists are particularly attractive in Milliken and Gale's *A First Course in Physics*, the half-tones of Lord Kelvin and of Faraday being especially noteworthy.

Maps. Great improvement is noticeable in the newer maps. The coloring is in softer tones. It is unfortunate and possibly unavoidable that the double page maps are still

[1] Macmillan. 1915.

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employed without special protection against wear and tear. The pupil in attempting to read the lettering on the creased portion of the map can hardly avoid removing the map from its binding. After a short period of service one finds that many of the maps will be loose and torn. West, for example, uses many of these maps. Robinson, however, employs the device of breaking the page about a quarter of an inch near the back of the book, thereby preventing the maps from being torn loose when the book is pressed open.

In books otherwise so excellent it is unpleasant to find maps like the Ethnographic Map of Austria-Hungary in Robinson's text, page 738, where the lettering in many places is almost unreadable. A similar defect is found in West's book on *The Ancient World*, page 283.

A very peculiar map of Alexander's Empire is given in *American Beginnings in Europe* by Gordy.[1] The boundaries of the empire are printed in heavy dark blue lines which fail to harmonize with the softer greens and browns of the body of the map. The total impression is Futuristic. The reader, of course, can easily trace the boundaries by this means, but one regrets that an otherwise artistic book is so ugly in this one particular. A similar map of ancient Greece is much more harmonious in color scheme.

Little need be said of the large maps in the more popular school geographies. Both the Tarr and McMurry and the Frye geographies are worthy of praise for their maps. Gannett, Garrison-Houston's *Commercial Geography*[2] has an unusual series of artistic maps.

Diagrams. Modern textbook authors show marvelous ingenuity in their construction of charts, graphs, and diagrams.

[1] Scribner's. 1912. [2] American Book Co. 1913.

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In mathematics books and texts on science these devices are especially common and striking. Canby and others in their *English Composition* [1] use an ingenious diagram in explaining the "Brief on the Value of Intercollegiate Football." The authors have constructed what at first might easily be interpreted as the front of a grand stand but what really represents a railroad trestle. Perhaps calling the diagram the framework of a grand stand would be more apt in discussing football. The main heads and subheads of the brief form the uprights and supporting ends of the structure. The whole arrangement is clear and interesting.

Summary. The foregoing considerations of the author's direction of study indicate that textbook making is not merely an abstract discussion of a branch of knowledge. The text is a tool and it must be used in certain ways for the best results. The author has made the tool. He is expected to understand its uses in accomplishing the important mission of introducing the learner to the principles, rules, and more important facts belonging to the subject he has discussed. In fulfilling his task the author will aid the pupil in getting a preview at each new stage in the rather difficult journey he has begun. He will, moreover, halt here and there and make note of the vital truths already studied. These truths have raised questions and problems. Because time and space have prevented him from taking inviting side trips the author will supply references and guides to such excursions if the schedule and the development of the pupil allow such trips. And he will also make sure that the pupil's comprehension is aided by appeals to exact copies of the things he has described. He will make charts and tables and diagrams

[1] Macmillan, 1914. p. 175.

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that analyze the problems considered. By this variety of suggestions he shows himself concerned with the development of those features in the learning process termed apperception, perception, recall, association, understanding, and thinking.

II. SUGGESTIONS BY THE TEACHER

The teacher stands between the author and the pupil. What has just been said regarding the author's directions of study does not minimize the need of having some one to help the pupil become acquainted with the author's manner of supervision. And it is because the teacher is indispensable in the learning process that his function as director of learning must be exalted. The teacher is not a dispenser of knowledge. He is a supervisor of learning. His whole calling is fundamentally concerned with training pupils to use their minds both for the understanding of essential facts, and for the discovery and application of knowledge. This being so, the teacher needs to know how to direct pupils in the handling of the tool now being considered. The author, we may presume, has done his part. Now the teacher supplements the author's suggestions by some of his own. This work of supervision, as far as the textbook is concerned, will follow at least three lines.

Evaluated Assignments. It is a common experience among teachers that pupils are unable to evaluate an assignment. They will either study haphazardly, or, in the effort to be conscientious, will memorize or otherwise study everything in the new lesson. The author has given several paragraphs in the chapter. There are many details which to the beginner and untrained pupil seem about equal in importance.

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He will either become confused or make use of memorizing in his desire to make a perfect recitation. He studies in order to recite, knowing that his class marks depend on his ability to recite. There are hopeful signs that this type of teaching is becoming unpopular. Alert teachers act on the theory that in each lesson there are important and incidental materials. It is right to expect teachers to know the distinction between these two kinds of subject-matter and to assign work accordingly.

The old-fashioned page assignment is not altogether bottled up for museum exhibition. There are some live specimens abroad and they are as mischievous as ever. However good a textbook may be it does not deserve to be studied in every detail. Few books are worth reading word for word and page by page. Reading and studying are in their very nature selective as well as intensive. Unless the teacher understands how to weigh the material in each assignment his pupils will be engaged in the lifeless task of studying one text and will confine their efforts to mere "book larnin'." There is need of the saner and happier conception of teaching which selects what is important and requires of the learner intensive application chiefly to this material.

In evaluating assignments the teacher will doubtless find it necessary at first to list the important things to be studied. The beginning pupil needs guidance along these lines, and there is little danger of giving him too much assistance. This does not mean that he should depend on such direction throughout the subject. With maturity in his acquaintance with the course will come the ability to evaluate for himself. Evaluating assignments in this way will require on the part of the teacher careful study of the contents of the course, and a

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thorough knowledge of the chief textbook used or of the several books selected for study. There is barely time in these days of multiplication of courses to do more than stress the all-important points in the course. But there may be time during the reviews for a consideration of some of the incidental material. The latter is not wholly insignificant, only relatively so.

When teachers realize that reciting is less important than ability to work with one's mind successfully and happily, they will find time not only for the daily review (the usual recitation), but also for the supplementing of the regular class-book study with reports that include incidental material as this and the more important matter are related to problems of application. The textbook then becomes a tool in thinking, which simply means the ability to relate important and secondary matters in an organization that answers a particular need. A textbook that is merely learned by heart is not a tool of learning; it is a device for training a particular kind of memorizing. But when the teacher carefully selects the material to be studied, and calls the pupil's attention to these important items in the lesson, together with the reminder that the remaining material should be read and considered in the light of the more intensive facts (but need not be so carefully studied), he has shown the pupil that the text is a tool of thinking as well as of understanding.

Explanation and Interpretation. Little need be said about this necessary duty of the teacher. It should be remembered, however, that each day's assignment needs careful elucidation so that the common difficulties are anticipated and obscure terms and meanings properly interpreted. This is especially important in the lower grades where the learning process is

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predominantly that of understanding and habit formation. It is a common theory that the learner should be required to master all difficulties without any help whatsoever. The effort itself, regardless of results, is valuable. What is meant in explaining common difficulties, however, is not this ever-ready willingness to do the work for the pupil, but rather to make it possible for him to work with more economy of time and effort. The new assignment doubtless will have obscure terms. Some of these can be looked up in the dictionary, but unless the pupil has been taught how to use the dictionary, he will find any number of meanings and probably will select one that does not exactly suit the context. Stating what these words mean in their present connection is not doing too much for the pupil. It saves his time and discouragement and failure. Explaining certain facts of history before the pupil studies them in more detail will make intelligible what he reads and organizes. To work out model examples on the blackboard with full explanation is not doing too much for the pupil.

The Open Book. What has just been said leads naturally into another aspect of study that strangely has been neglected these many years. Few teachers in the past would allow the pupils to keep the books open during the recitation. And to have a book open during examination was, of course, horribly impossible. But after all why not have the book open? If we discard the memoriter recitation, will it not be a splendid test of understanding to keep the books open and have the pupils explain what the author says, and give proof that the principles and rules in the lesson are appreciated and can be applied? What we are concerned about is the pupil's ability to use the book as a tool. In years to come he will have for-

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gotten many of the details in his earlier courses. How many who read these pages can work a problem in cube root? But once you could. To revive the earlier skill all that is needed is to refer to a book in arithmetic and the submerged ability will be restored. It is not vital that all or most of us should know cube root, but if some need arises for the processes of cube root it would be helpful to know how to follow the directions of the textbook in its explanation of this kind of work.

The open book in literature and history is full of interesting possibilities in an oral supervised study period. It is an aim of education to encourage pupils to express knowledge in their own words. With the textbook open before them pupils may be trained to state briefly and clearly what the author has written, giving his thought in a terse summary, and evincing by the careful and carefree use of language that the meaning is well understood. This does away with the common monotonous repetition of the author's exact words, an evidence that the pupil has simply committed to memory what has been written.

The open book should be used in the beginning of a course, and so continued until the pupils have become fairly well acquainted with the work involved in the course. Occasionally thereafter the book may be open during review, for the review is concerned not so much with facts memorized as with principles and facts well understood. Many teachers would be surprised to find that if the pupils were allowed to use books during examinations the results would not be necessarily an increase in high grades. Giving the pupil a page in literature or in history and requiring that the author's meaning be stated in a few clear words might prove to be a much more

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difficult examination than asking a number of factual questions about what the author writes.

Summary. The teacher must know how to handle the textbook and must be able to train the pupils in their employment of this tool. The tool can be rightly used or wrongly used according to the teacher's ability to guide the pupil. Helping the beginner to select the valuable and disregard the less important material is one way of teaching him the economical use of the tool. Explaining the common difficulties in the new assignment is hardly different from explaining to the manual training pupil the peculiarities of a saw or of a lathe or of a piece of wood. Regarding the textbook as preeminently a guide to be frequently referred to, the teacher and pupil will study it together as it lies open. There will be days when the pupil's progress will be tested with the books closed, but it should never be forgotten that progress educationally does not mean simply ability to recite well from memory. Education means also ability to understand and interpret, and to gain these ends it is not essential to depend on a closed book.

III. REACTIONS BY THE PUPILS

Having considered the author's and the teacher's directions as to how the textbook should be used as a tool of learning we are now interested in observing how the pupil handles the tool. However effective the text may be either by the author's skillful construction or the teacher's wise and discriminate employment of the book, it becomes for the pupil even more valuable if he reacts to it in a manner that really sharpens it for service. It will not be necessary to elaborate the sug-

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gestions that follow. They are referred to here more as reminders than as anything wholly new to the teacher.

Underscoring. It is only rarely that one finds a period or part of one devoted to instruction and training in the important study device of underscoring. The common use of free textbooks has made it somewhat prohibitive to "deface" books with pencil marks of any kind. And indiscriminate underscoring is, of course, worse than none at all. But if underscoring is done with a soft pencil, and made lightly, erasure is quite easy, and the result leaves the book in a condition little worse for this kind of wear. If brackets or parallel lines are used instead of long horizontal lines, the benefit to the pupil will be as great and the possibility of harm to the book will be diminished. The work of underscoring important points or sentences might well form part of an assignment, a test, or an examination, either in the book itself or in quotations written on paper or on the blackboard.

No small part of education's great task consists in training the individual to pass judgment on the train of experiences that will certainly modify his development in one way or another. It is not implied that underscoring and similar devices of evaluation will produce in the pupil a peculiar power of judgment. They will, however, direct his attention to the need of passing judgment very early in his career on whatever affects his life. He must know what is important and what is incidental. He must see clearly the difference between the false and the true. He must distinguish between what has been well done and what has been poorly done. He must sense the controlling principle that designates one thing beautiful and another thing ugly. As it now is, he is

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tempted to memorize or to neglect everything in school work. He is not encouraged in all subjects to weigh evidence, to verify statements, to understand thoroughly what he reads. Analysis often means mere outlining in composition or simple experimentation in science (a merely imitative type of experiment).

It is by careful selection of what is important and the discarding of all non-essentials that ideas gradually become general and universal. One finds much biased judgment in everyday affairs, as well as in the higher realms of thinking. Emotional prejudice sweeps away the judgment of what is really good and of what is bad in an enemy. We cannot (at least we rarely do) see all sides of a question. A narrow, often selfish, frequently hasty interpretation sweeps us to an unfair conclusion. The trouble is that we have not been trained to adopt the judicial attitude. From early school days we have become accustomed to accept things as of equal value or of no value, or of supreme value, all according to the emotional dictum that commands us at the moment.

In school the line of work must be switched toward a very definite program, that has in view the discriminating individual, the balanced reflective citizen in whose charge the affairs of family and of state may be reasonably safe. There is no need of individuals who have crammed their minds full of merely interesting facts and notions (because curiosity naturally gave them a bias), but who thereby seemingly have not developed directive skill for themselves or for the state. All school work needs to be characterized by the reflective attitude and not merely or chiefly by the processes of memorizing and imitating.

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Notations on inserted pages, fly leaves, or on the margin of the page save much of the time and strength commonly employed in notebook work. They have the value of keeping the related material in close proximity where the pupil can readily find it, and more easily see its relationship to the printed contents of the book. If the pupil owns his book, it will be more feasible to make extensive use of notation. Practice in writing many points in an orderly manner on a small page may prove important beyond the immediate needs of the assignment.

Cross References. Bewildering indeed is the state of mind of the average pupil when asked to show how his various courses are related or how the several parts of each course are connected in meaning and significance with other sections of the subject. And correspondingly he is overjoyed to recognize in one subject what he has learned in another. His hand will be raised in eager willingness to indicate that he is familiar with this term or idea, etc. Much of the confusion common among pupils would be relieved if they were trained in connecting up similar material by means of some scheme of cross reference from page to page or from book to book. A short line under a word and opposite thereto in the margin a page or book and page reference is all that is needed. When the subject is reviewed these references will make the old meanings even richer.

This type of reaction makes the best book appear to the pupil as something akin to an interesting puzzle which he and others in the class are solving. He covers more ground in his reference work. The assignment, which might include the employment of the index as a key to reference material, becomes more meaningful if this work of organizing is required.

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And when each teacher encourages similar correlation between courses the pupil will soon appreciate the fact that he is engaged in a work that hangs together; that each subject may help him in learning another; that school tasks are not a meaningless jumble but really fit into a rather unified scheme, just as one experience in life may be of great value in gaining and rightly using other experiences. "Book larnin'" changes into the fascinating task of constructing knowledge and ideas. One book is insufficient. One author is not enough. Many leaders are required, but the pupil begins to realize that while they may differ they also agree, and it is the agreement among books and authors that he must find and understand.

Summaries. It cannot be repeated too often that one of the ends of education is to train the pupil to state in his own language, with increasing clearness and accuracy, what he has studied in the language of others. This need of summarizing can be satisfied not only in written recitations or tests but also in oral expression. The pupil will have more need of talking about history, literature, science, and civics than writing about them. The test of education will be his ability to use school experience readily in the common avenues of living. We educate also for emergencies, but the bulk of skill, knowledge, appreciation, and understanding will deal with the common day's affairs. Most of us have more need of talking than of writing. The brief oral digest of a paragraph or a section of the assignment is therefore valuable to all pupils regardless of their possible careers.

In the business world there is frequent need of clerks who can summarize the contents of correspondence in a line or two. Clerks and secretaries in too many instances cannot find the all-important item that needs special attention. The

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busy employer wants a secretary who can read a letter and then give its contents in a few words, accurately and comprehensively, in the margin. This need of summarizing in a few lines is urgent when the employer gives the secretary or clerk a few directions from which a letter is to be framed, a letter, moreover, that will meet his needs with or without inspection on his part. The rush of business, the multitude of details in all forms of business and professional work, requires fine ability to extract the all-essential and to make a brief satisfactory summary of a number of details. Unless the schools call attention to this constant demand of the business world, and train the pupil in this sort of method, he may only slowly and perhaps too late find that his chances of promotion are snatched from him by those whose mental training makes their services of greater value to an employer, be the employer an individual, an institution, or the state.

Care of the Book. We disapprove of the worker who allows his tools to become rusty and to remain dull. The hunter is proud of his highly polished gun, with barrel and bore shining like glass. The machinist keeps his engines and motors bright and beautiful. And we regard it as a defect in his training if the pupil is allowed to tear, soil, or in any way misuse the textbook, even if he owns it himself. A weekly inspection of all books is therefore a wholesome exercise. It takes only a few minutes and it impresses upon the pupil that part of his education is respect for the tools of education. Toothbrush drills are common in the grades. Textbook inspection in both the elementary and secondary schools (one might also add and colleges) has moral value.

Summary. The pupil's reaction to the textbook consists not only of the intelligent reading of its words or content

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in general, but also of his evaluating its material and making this expression of judgment serviceable by means of discriminate underscoring. Supplementary material, as suggested by the author's treatment, should be recorded on inserted leaves and if the book is owned by the pupil, on the margin and fly-leaves. Cross references to similar material in the same book or in other books and courses help him to unify what he studies. Skill in stating briefly and accurately in his own words what he has learned will be required of him throughout life; and therefore he needs training in this art of summarizing, some of which will be done in writing but most of it orally. As a workman in abstract subjects he should be required to take the best care of his tools, taught to appreciate the value of neat and clean books, not only because they are books and therefore the record of human labor but also because they are property. An individual's respect for property, personal and real, is an indication of his social refinement, his sense of social responsibility, and no teacher can afford to minimize the importance of this essential in the training of young citizens.

QUESTIONS AND PROBLEMS

1. Do you find that your pupils understand how to handle the textbook as a tool? How many of them do? How do you test their skill?

2. How would you teach pupils to make syllabi in the subjects you teach?

3. Do you find syllabi in any of the texts that you use?

4. Have you ever tested the pupils' ability to study by having them make questions and state problems on an assignment? What processes of studying are involved in such ability?

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5. What per cent of the questions and problems in your textbooks are thought-provoking and vital?

6. Have you ever included in examinations the assignment to summarize a chapter or a page? What would such questions test?

7. Do the illustrations in your texts awaken interest? Are they studied in class? Do the pupils ever ask questions about them? What are the functions of book illustrations?

8. What difficulties do the pupils have in understanding diagrams? How do you try to remove such difficulties?

9. What is an evaluated assignment? Wherein does it excel? What kind of preparation on the part of the teacher does it require?

10. How often do you require the pupils to recite with their books open? What kind of recitation does this call for? What processes of learning are attended to under such conditions?

11. Part of each period might be used for training the pupils to use the mechanics of studying. How would you deal with this type of work so far as the free textbook is concerned?

REFERENCES

BLAIR, F. G. "Study and the Use of Books." N. E. A. Proceedings; 1909. P. 852.

BUCK, E. C. *Guide to Teacher's Mastery of Texts.* 2d Edition. E. C. Buck; Cedar Falls, Iowa; 1908.

CRAMER, F. *Talks to Students on the Art of Study.* Baker, Taylor, New York; 1902. Ch. ix.

DEARBORN, GEO. V. *How to Learn Easily.* Little, Brown, Boston; 1916. Ch. IV.

EARHART, LIDA. *Teaching Children to Study.* Houghton Mifflin; 1909. Ch. IV.

HALL-QUEST, A. L. *Supervised Study.* Macmillan; 1916. Pp. 166–71.

HINSDALE, B. A. *The Art of Study.* American Book Co.; 1900. Ch. vii.

HORNE, H. H. *Story-Telling, Questioning and Studying.* Macmillan; 1916. Pp. 129, 130, 143–8, 160, 161, 167–9.

Digitized by Google

KITSON, H. D. *How to Use Your Mind.* Lippincott, Philadelphia; 1916. Pp. 32, 33.

KOOPMAN, H. L. *The Mastery of Books.* American Book Co.; 1896.

MCMURRY, F. *How to Study.* Houghton Mifflin; 1909. Pp. 107–10.

PARKER, S. C. *Methods of Teaching in High School.* Ginn, Chicago; 1915. Chs. XVI, XVII.

SANDWICK, R. L. *How and What to Study.* Heath, Boston; 1916. Pp. 32–6; 55–60.

STRAYER, G. D. *A Brief Course in the Teaching Process.* Macmillan; 1913. Pp. 108–9.

WHIPPLE, G. M. *How to Study Effectively.* Bloomington, Ill.; 1916.

Wicomico County, Md., School Board. "Guide for Teachers in Use of Textbooks for different grades of public schools." Wicomico County, Md., Tallisburg, Md.; 1909.

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CHAPTER VI

THE TEXTBOOK AS A GUIDE

SOME of the suggestions considered in the preceding chapter require additional discussion. At the risk of seeming to repeat, I wish to deal with the textbook as a guide to reference reading, correlation, application of problems, and reorganization of the author's material to the needs of a particular group of pupils. The textbook points the way to these essentials of constructive training, either by itself or by the teacher's mode of treatment. Few texts, however, are adjusted to the pupil's universal and local needs alike. The experienced teacher knows this, and can only expect that the text selected will prove so suggestive in its organization that needful adaptation will be possible with a minimum of extra labor. No one text should be regarded as an *ipse dixit.* Its chief value lies in directing the teaching process into the most fruitful achievement, by introducing teacher and pupil to the most economical and convenient methods of travel in the new territory of truth. It is a Baedeker and like every guidebook must be revised and amended and applied according to the peculiarities of the individual traveler.

The Functions of the Textbook as a Guide. *A guide to reference reading.* Reference books may be conveniently classified as follows: Dictionaries, Encyclopedias, Biographical Dictionaries, Year Books, Concordances, Catalogues, the

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Atlas and Gazetteer, Periodical Guides, Reports, and Statistical Bulletins. In a broader sense any book or publication that supplements the main textbook may be regarded as a reference book. More accurately, however, the latter division would be termed Supplementary Books as distinguished from the former, which in library terminology are classified as Reference Books. The methods of using the two divisions differ.

The study of the dictionary. Of these reference books the young pupil has more need of the dictionary and atlas, but the older pupils in the upper grades and in the high school, and students in college, use all of them with the possible exception of the Year Book, which is more professional. Assignments in the usage of these books are customary in English courses, but they should form part of the work in any subject whenever needed.

Assignments in dictionary work would include the finding of words by means of the thumb index and guide words on the top of each page. The top left-hand word indicates the first word in the column and the right-hand word the last word in the right column. Spelling and pronunciation, especially the former, are given in the dictionary with preferable usage where more than one kind of spelling and pronunciation are current. It is doubtful if much attention need be given to instruction in pronunciation by means of the dictionary in the lower grades. In the upper grades and higher schools it will be profitable to explain the marks used to guide the reader in pronouncing, but even with such help pronunciation is determined as a rule more by example than by dictionary methods. Derivation of words is an interesting study to the pupils engaged in studying a foreign language and might well be used in showing the practical value that

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foreign language work has for a readier usage of English. Synonyms form another branch of study, and one that is of peculiar value for accurate and euphonious speaking and writing.

The study of the dictionary, however, that is least satisfactory and yet of widest significance is the selection of definitions. A class of seventh-grade pupils were assigned the task of using a list of words selected by the commercial department. Among the words was "accumulate." The pupils consulted the dictionary, found definitions, and then wrote sentences. These sentences referred to accumulating hay, rocks, straw, candy, marbles, etc., but only one pupil mentioned accumulating wealth, which was the context preferred by the commercial department. As a rule we do not speak of accumulating candy and hay. The definition was correct but the context had been disregarded. Kerfoot in his interesting volume on *How to Read* reminds us that reading depends almost entirely on the context. And the nicety of diction is one index of true culture.

Training pupils in the selection of suitable definitions is a difficult and indeed an impossible task if the teacher disregards the demands of the "set" of the word in a particular connection. The random selection of definitions will yield ludicrous results. In connection with the study of definitions it would be interesting and not without profit to study idioms and even slang. The latter may not be deemed wise by purists in English courses but all of us enjoy baseball slang, and George Ade and his rival in slang, Billy Sunday, are popular because they use these picturesque short cuts that in many instances are destined to become the main paths of verbal expression. Slang is language in process of transition. Most

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of us use it. Most people say "cut out" instead of "eliminate" or "excise" and other strange-sounding words. Slang may not be a sign of educational polish but it certainly gives meaning "a home run."

There will be less need in the lower grades to train the pupil to consult the encyclopedia or geographical and biographical dictionaries. In the upper grades and throughout the high school, instruction and practice in handling all needful reference material should stimulate in the pupil respect for those sources of knowledge. Drill here is just as essential as in arithmetic or in spelling. If the textbook is meager in suggestions along these lines, it becomes the teacher's responsibility to enrich opportunities for reference work.

A guide to correlation. In undertaking this important work the teacher, of course, will be handicapped if the school authorities do not supply additional books. In history it is well-nigh impossible to do justice to the course without consulting other books and, in these times, periodicals. Correlation is simply an application of the laws of association without which memory and learning are impossible. To teach history without referring to suggestive material in literature and science is to limit historical study to little more than chronology. The increasingly accepted method of teaching mathematics in connection with shop and laboratory work, dealing with the principles and rules of a particular assignment in the respective courses, enhances the interest and facilitates the understanding of all the coördinated work.

The textbook guides teacher and pupil into cognate fields by listing problems, supplying allusions to related subjects, and by definitely suggesting that additional assignments should be made in cognate material. When so used the book

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becomes to the pupil a real guide into the larger reaches of the subject, and he begins to appreciate that the subject being studied is not a one-book course but that it has fascinating vistas and world-wide sources and meanings.

The pupil should be trained in this supplementary work just as carefully as in any other process of his development. He is in school primarily to learn how to learn. But this is not all. He is in school to learn how to form and manipulate ideas, which, after all, are the quintessence of experience. He assuredly gets many ideas from one textbook; but through the school and through the public and private libraries he enlarges the scope and extends the variety of ideas so that his acquaintance with any one subject is fairly universal. He must learn not only to hunt for books, important as this may be, but also to seek for subjects, for new angles of viewpoint, for the antitheses of judgments on a particular topic. He, of course, needs training in all of this, very careful supervision, in fact, but that is the main business of the teacher.

The problem of correlation, so far as the use of the textbook is concerned, is really *the topical assignment*, which of necessity makes use of more than one book. Training in the study of this kind of assignment must be given by some one who is enthusiastic and who is skillful in its technic.[1] A well-selected school library is required where the subject-matter of each course is at least fairly well represented in several textbooks. It demands also specific supervision, at least in the beginning,

[1] Attention should be called to The World Book, edited by Professor O'Shea and published by The World Book, Inc., of Chicago. This work is written for public school pupils and is a valuable attempt to supply general knowledge in a simple and pictorial manner. As a reference work it is admirably designed to help pupils in topical assignments.

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by the teacher of each subject by means of carefully evaluated reference lists with title and page stated accurately. The pupil needs to be encouraged to augment these lists by his own efforts.

In some subjects it is indispensable to even a preliminary grasp of the contents that class copies of various standard texts be available. In civics and government, for example,[1] there are many of these books, some relating more specifically than others to city problems and municipal government, while others treat principally of the national government. Many of them deal chiefly with organization and administration of public affairs. Again, in others these political discussions are subordinated to civic and to social problems. Too much emphasis cannot be placed on providing the pupil with the points of view of many books not only in civics but in history and in science.

A guide to applications. Whereas formerly any problem that forced the pupil to think was regarded sufficient for class exercises, to-day authors of textbooks sense the imperative need of stating problems that stimulate thinking because they express practical difficulties, such as might arise, and in fact do arise, in the ordinary affairs of life. A glance at recent textbooks in mathematics proves how the scope and nature of these textbook problems have changed. We live in a practical age, which means educationally that we test practice material by its value for ordinary experiences of life. Book catalogues now contain such titles as the following: "Community Arithmetic," "Vocational Arithmetic," "Vocational Arithmetic for Girls," "Rural Arithmetic," "Business Arithmetic," "Business English," "Civic Biology," "What Can

[1] See U. S. Bur. of Educ. Bulletin 1915, No. 23, pp. 52, 53.

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Literature Do for Me?" etc. It is not *the school and life* any longer but *life in the school* that compels attention.

The textbook becomes invaluable when its material is clearly presented in life terms. In fact, unless it does so treat its contents it has no place in the program of the modern school. Teachers of Latin are eager to show that this much-harassed subject has practical value. There is hardly a study in the modern school that is not being shifted from the traditional basis of mental discipline to that of vital functioning as a direct training in skill of living. The shift has been made not simply to practical problems but to problems that arouse interest in each pupil by suggesting to him opportunities to frame his own problems, and to solve them according to the principles and rules of the respective subjects. This is an immense step forward in the serious concern of economy of time in education.

A guide to reorganization. The preceding functions of the textbook as a tool and as a guide may be summarized in the all-important task of training the teacher to reorganize the text to suit local needs. An author may be logical in his presentation but this does not assure a psychological approach. To begin a text, for example, with a number of dry and abstract definitions later to be applied may be logical, but it certainly is not psychologically correct. The fact that a definition is abstract indicates that it summarizes a wide range of observation and investigation. It becomes intelligible only when used deductively, but its meaning would be more quickly appreciated if developed inductively and heuristically, the pupil being led step by step through a series of interesting observations to the conclusion expressed briefly in a law or definition. This is common enough pedagogical procedure and does not require elaborate discussion.

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Applying this psychological method to the treatment of the text, some teachers wisely change the author's sequence of chapters. The revised arrangement will be determined by the pupil's preparation and by the immediate aims of education in a particular locality. There may be needed a change of emphasis; some chapters perhaps can be condensed or wholly omitted. Probably few teachers of psychology follow the order of topics in the text they have selected. Teachers of literature may find it an advantage to abandon the usual order of historical treatment and reorganize the text on the basis of topical study, beginning with the current forms of literature such as the novel, the editorial, the essay, and tracing these back to earlier forms and electing for intensive study well-known masterpieces. The alert teacher will not be hampered by the textbook organization, but will construct a scheme of presentation that is adapted to the class. It is likely that other classes will require a somewhat different kind of presentation, and no progressive teacher will expect to teach the same course in exactly the same manner every term.

The need of reorganizing the textbook for teaching purposes is illustrated in the changed sequence of chapters and insertion of new material in more recent texts as compared with much earlier ones. In algebra, for example, some of the earlier texts devoted many pages to abstract rules, definitions, and examples without providing, until near the middle of the book, any opportunities for worth-while applications. Equations were not introduced until the four fundamental processes of addition, subtraction, multiplication, and division had been studied. In more recent books chapters on the equation are inserted throughout the work, the pupil finding by this means opportunity to apply abstract rules and principles to con-

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crete problems. In this way studying is clinched by early application. The older books, moreover, contained no chapters on graphs. Problems are more numerous and more practical in recent volumes. There is evident in these books reorganization of a kind that the teacher must make if unfortunately the book is unsuited to his pupils. On the whole, the tendency in the best kind of textbook reorganization is toward simplicity. The old plan of crowding the textbook with pedantic and abstruse learning is giving way to easier and shorter treatments.

Summary. The text is a guide to interesting side trips or to points of special interest along the way. Its guidance to reference material and to cognate subjects means the enrichment of the pupil's grasp of the subject. Its translation of rules, definitions, laws, principles, etc., into life needs, as felt by the pupils and as recognized by them, makes the textbook invaluable in preparing the pupils to cope with the common difficulties of living. When used in this manner the textbook interprets education as a great privilege which the ordinary man will struggle to own. It makes learning social. It blunts the stinging criticism that schools do not link up with life. And these various calls upon the textbook as a guide will result in such reorganization of its contents and sequence of presentation as the interests and needs of a particular class may require. The textbook when so used becomes not a dead paper education but training for immediate as well as remote ends; and it is fitness for immediate living that the ordinary man wants. Education simply for remote achievement is too idealistic for the average citizen. We see the remote through the eyes of the immediate. Unless the present is well understood and gladly utilized the remote will vanish in the mists of vain dreams.

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QUESTIONS AND PROBLEMS

1. Do you have adequate facilities for reference reading in your classes? If the school does not supply such material how can you still get some? Have you ever asked the pupils to bring to class such texts as they may be able to find at home, or borrow from their friends?

2. How would you develop in the pupil discriminating selection of word meanings?

3. Why is correlation important? Why is so little of it done in teaching?

4. Can the textbook offer a sufficient variety of problems to meet the needs of every pupil? What is the best service it can render in the field of application?

5. Do you use the book in the order selected by the author? Is it necessary to do so? What determines the kind of reorganization that you adopt?

REFERENCES

FOSTER, W. E. "Libraries and Readers." Publishers Weekly. New York.

GREEN, S. S. "Libraries and Schools." Publishers Weekly. New York.

HALL-QUEST, A. L. *Supervised Study.* Macmillan; 1916. 172–77.

HARRISON, F. *The Choice of Books and Other Literary Pieces.* Macmillan; 1903.

HINSDALE, B. *The Art of Study.* American Book Co.; 1900. Ch. IX.

KERFOOT, J. B. *How to Read.* Houghton Mifflin; 1916.

PORTER, NOAH. *Books and Reading.* Scribners, New York. 41, 42. 1901.

S. R. WARREN and S. M. CLARKE. U. S. Bureau of Educ. *Public Libraries in the United States;* 1876. Ch. IX.

WISWELL, L. O. *How to Use Reference Books.* American Book; 1916.

WOLFE, L. E. "Many versus the few book course of study." Educational Review. Vol. 45; Feb., 1913. 146–54.

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CHAPTER VII

THE TEXTBOOK AS A SOURCE OF KNOWLEDGE

THERE was a time when men regarded learning as something mysterious and esoteric, a treasure hidden away from common mortals and accessible only to super-intellects and to the gods. Locked away in dungeon archives; recorded in heavy language that successfully imprisoned meaning; made intelligible only by long years of sacrificial toil, learning became the privilege of aristocrats and royalty who possessed the magic sesame to truth. The ordinary man was led to believe that learning dealt with life far removed from any experience of his own. The priest, the philosopher, the magician, must be consulted humbly and obediently. Knowledge was a goddess, if you please, whose acolytes demanded heavy pay for the flash-like glimpses they permitted of the image of the Invisible.

Fortunately for the race access to learning has been democratized, not without struggle and pain, but democratized nevertheless, incarnated to dwell among men as servant and friend. Throughout many centuries, by trial and error, careful experimentation, profound reflection, occasional flashes of insight, men have collected fragments of experience and erected highways and safeguards of living that are becoming available to all members of the race. Compulsory and universal education are watchwords of the hour. Ignorance is the fountain curse of human woe. Knowledge is the incarnating principle of individual and social welfare.

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How Knowledge Began. Education depends upon the proper understanding and application of experience. All of this experience is not available in book form. Much of it is obtained by motor imitation and social adjustment. By word of mouth many important truths are transmitted by the Oriental to his children and neighbors. And this oral instruction is so accurate and so well understood that it could hardly be better in written form. There are many facts and principles, however, that require the printed record. Subject-matter in book form is one of the means whereby racial experience becomes accessible to the learner. It is a condensed history of man thinking his way through the various problems of living to a solution that appears for the time being more or less adequate.

But man has been stimulated not only by problems of everyday living to acquire deeper insight and wider scope of knowledge concerning the world in which he lives. Beyond the commonplace, the immediate and the physical is a realm of the unusual, the remote, and the spiritual (as this latter term applies to all that is not physical). The mysteries of this other sphere stimulated man's curiosity and awakened the explorer's instinct to find the meaning of the unknown. This large field of human endeavor resulted in theories, in certain inference and fears and aspirations that became no small part of the racial heritage. One finds records of it in priestcraft, astrology, alchemy, myths, magic, and in sundry other applications of the psychical.

These two lines of experience, the practical and the spiritual, do not appear as constantly parallel or mutually exclusive. The everyday problems may contain much that is incomprehensible to the ignorant; such phenomena, for example, as

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the thunderstorm, the lightning, the cause of disease. They do, however, represent man in his relation to his external environment. In one way or another he is trying to find meanings and fairly constant attitudes that will economize living by reducing it to the plane of habits. He is thinking, *i.e.* trying to make his environment familiar and so quickly understood that each day's toil may result in assured ways of using his environment.

There are methods of counting his sheep so that the loss of any may be quickly detected. Communication with his tribal members is important, and so he employs gestures and other motor reactions (pictures, lines, symbols) that will convey to others what they and he can understand together. Ceremonies and rites become intricate symbolisms of life, meanings in which bravery, endurance, loyalty, reverence, etc., are significant attitudes. Sounds are employed, at first imitative and expressive of emotional crises, some of them short and loud, others long and soft, or frequently repeated to convey accumulative intensity of meaning, such as "holy, holy, holy." The passing away of loved and revered ones is comprehensible to the racial child only on the ground that the departed have gone to the world where live the strange forms that come in dreams and in moments of ecstatic vision. All of this, too, is part of his external environment; and man satisfies his questioning mind by the easiest answer available.

One might continue such detailed study as the foregoing almost indefinitely. Enough has been hinted at to indicate that racial experience in the form of instructional materials arose in man's effort to understand his environment, so that he might fear it less and use it more. He needed certain media of communication by means of which group strength could

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be accumulated. He found some of these media so advantageous that they became part of his training of the young. The latter would become more speedily of value to the group if they early understood some of the factors that were involved in the protection and in the prowess of the group. Slowly this store of serviceable knowledge increased. Together with it appeared many interpretations of life that seemingly had no other explanation. These theories and beliefs were accepted as true, and therefore valuable for the young member of the family and of the tribe.

The Meaning of School Subjects. The school subjects of to-day are, then, little more than organizations of racial experience, both in actual physical living and in efforts to interpret the unknown. The textbooks present these subjects in convenient form so that the learner may become an efficient member of society, or one who appreciates the interests of his many brothers and can work with them for the good of all. He could get most if not all of this knowledge without any textbook, but in the majority of cases he would then need to depend upon some one to introduce him to the facts of experience. This guide or teacher would need to arrange the material so that economy and efficiency might be assured. While such studying apart from other members of the group might have laudable advantages (the tutorial system has certain distinct benefits), the learner might fail to grasp the significant fact that the bulk of knowledge is social; it arose for the sake of the group; it must be used for the uplift of men. *The textbook is a record of racial thinking organized for instructional purposes.* It is a source of knowledge which the learner must study in order to apply it to his own problems of life, which are mostly social. Its contents came from man's attempt to

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penetrate into the unknown, and this resulting knowledge in turn must be applied to life for the benefit of man and for such revisions and additions as experience to-day may provide or require.

Principles Underlying the Use of the Textbook as a Source of Knowledge. The foregoing statements regarding the meaning and purpose of the textbook call attention to a few principles that must not be ignored in the consideration of the text as a source of knowledge. We have noted the fact that a large part of the subject-matter in the textbook is the result of man's *reflection* upon the problems that have clamored for solution. It was imperative that these puzzles of living be solved, for only in this way could man progress toward an appreciation of the meaning of his own life.

Reflection, however, did not always, perhaps not usually, present the desired answers. *Trial and error* occupied much of man's time. As the accumulations of knowledge increased he, of course, had less need of trial and error in the fields where some gains had been made. He could study what others had wrought and more quickly apply their results to similar problems in his own life.

Reflection, acquisition of knowledge and its application were common processes in the conflict with the temporarily unknown. Man found that with a richer store of knowledge he could make more satisfying applications; he could understand more thoroughly, he could sense and penetrate problems more easily. In this way he caught glimmering ideas of his own meaning; he discovered that life is a process (is it endless?) of finding meanings and making adjustments that result in a closer approximation of unity between the world and himself. And so knowledge appears as the result of a continuous uni-

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fying and harmonizing effort. It is the basis of the resistless urge to extend the unification or the harmony already made known, as Plato and Aristotle so clearly demonstrate. The very fact that man to-day continues to seek in the same fields as his ancestors indicates that he is not yet satisfied. The lure of the trail is as strong as ever. Man must seek; he must think.

Some of the Gains of Thinking. The effort to pierce the veil has not been in vain. Man's intellectual adventures have brought him priceless treasures. For one thing, he now has a language. He has complex systems of knowledge in mathematics, physics, chemistry. History of political, economic, and social change and progress has written her fairly intelligible messages. Literature and art; industry and commerce; religion and morals — these now have profound meanings and bewildering avenues of application. Much has been achieved. Some things have been settled — at any rate man is satisfied in their presence. Two plus two equals four; noun and corresponding predicate; the mutual exclusion of the positive and the negative; the rotundity of the earth; the prediction of comets and of solar eclipses; the conception of human brotherhood; — these and myriads of others are some of the controls of experience that have been gained. The student of to-day can be assured of a reasonable amount of finality in these and in many other domains of thinking.

In our eagerness for the practical or for that which demonstrates its functional value we must not forget that man has spent glorious years on problems that echo mysteries even greater than those of time and clay. The philosophic interest, the activities of classical scholars, much of astronomy, a large part of history, literature, and mathematics are included in

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this class. The learner of to-day must be informed of man's efforts in these fields as well as in those more tangibly practical. For all we know there may be other adjustments required of the race, adjustments that have root meanings in the worlds purely spiritual, but which also have connections with the physical and the temporal. However this may be, we do know that ideas and ideals have tremendous functional value. Standing with Plato as he beholds the far reaches of the world of eternal ideas is an experience difficult to estimate. It is like the northland traveler's gaze upon the shimmering aurora, silent, ineffable, majestic, redolent with mystic charm. For the young learner not to have his mind brush against the noble thoughts of spiritual explorers is to withhold from him the testament of his ancestors.

The Paramount Question of Education To-day. Now the paramount question in education is: What value has this boundless depository for the learner to-day? Much of it has very evident importance. But the question is clearer if stated: What is the purpose of knowledge in the public schools or in the textbooks? As we find it in all too many texts and in all too many classrooms, knowledge is presented loosely and as a catalogue of dry facts. The purpose of education is not to introduce the pupil to facts, as such, but to the facts and their meanings. The meaning becomes known only as each fact is perceived as related to other facts, all of them illustrative of a great truth.

Knowledge must be viewed as a system. The pupil all too frequently is forced to hurry through the many details of the course to a rather hazy notion of the meaning of the whole. He is not stimulated to organize the facts or to find in them fragments of a great unity of which each detail in the course

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is a necessary and important fact. Rarely, and even then only meagerly, does he sense that knowledge in the textbook is a bit of experience, which consists of bundles of interwoven associated facts and ideas. The evolution of knowledge shows that early truths became fuller and richer as man used them and found them stimulating to new lines of thought. Knowledge is like the growth of the banyan tree. It has units but they are all connected in ways visible and invisible. Knowledge exists in a system. New experience has meanings only as it finds a place in the system of truth already established. Evolution of thought and knowledge becomes possible because each additional experience modifies to some degree the already existing system. The pupil in the school, then, must become aware of the large system, and that his present task of studying belongs at a certain point in the general whole.

Three Functions of the Textbook. The textbook as a source of knowledge has therefore three closely related functions: (1) It presents certain facts of experience valuable to man in the past and helpful to the individual and society now, wherever needs of the past and the present are similar. (2) It gives an account of facts together with principles and ideas illustrated by the facts, not in isolated detail but with certain connections and associations that tie together all of these items of knowledge into a unity or a system. It is, to be sure, only one of many systems. But the pupil is now engaged in the task of understanding this particular organization of experience with its parts and details. (3) The textbook as a source of knowledge must stimulate the pupil to contribute to the work of man other and perhaps better experiences that will improve the conditions of living. The pupil is not to study the principles and facts and the system simply for their

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own sake. By them he must become excited with the huntsman's zeal. He must learn to discover truth; he must learn how man thought his way to certain achievements, and like him he must go out with keen mind and deep appreciation to augment the inheritance of the race.

Because the fruits of the mind have been collected so laboriously and patiently teachers must inspire in the pupil respect for this large heritage of man. The textbook may appear uninteresting, but it is none the less a depository of some of this inheritance. It brings to the pupil an introduction to a large field of knowledge, some of which is fundamental to human intercourse and coöperation, and the remainder valuable to his unfolding as another contributor to the ever-accumulating heritage of human thinking and industry. For the pupil needs to be impressed with the claim society has on him to invent and multiply the common racial inheritance.

Well does Rousseau write:[1] "The misuse of books kills knowledge. Believing that we know what we have read, we think ourselves excused from learning it." In the same vein Locke writes:[2] "There is not seldom to be found, even amongst those who aim at knowledge, who with an unwearied industry employ their whole time in books, who scarcely allow themselves time to eat or sleep, but read, and read, and read on, yet make no great advances in real knowledge, though there be no defect in their intellectual faculties to which their little progress can be imputed. The mistake here is, that it is usually supposed by reading the author's knowledge is transfused into the reader's understanding; and so it is, but not by bare reading, but by reading and understanding what is

[1] *Émile*, Book V. [2] *Conduct of the Understanding.*

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writ. Whereby, I mean, not barely comprehending what is affirmed or denied in each proposition (though that great readers do not always think themselves concerned precisely to do), but to see and follow the train of his reasonings, observe the strength and clearness of their connexion and examine upon what they bottom."

Important Factors in the Structure of the Textbook as a Source of Knowledge. Because it does present knowledge it is important for teacher and pupil to note some of the structural elements in the textbook that indicate the age, the title, and general arrangement of a particular field of knowledge.

Dates of publication. As a rule little attention is given by the pupil to this necessary item in the appreciation of the subject-matter in a textbook. Dates are landmarks of historical development. Most of us dislike to be considered out-of-date in dress or in point of-view. The old fogy is caricatured and the ultra-conservative ignored. But in many communities an old textbook is regarded, because old, as better than more recent and better informed books. How many teachers and how many pupils look at the date of publication? Do they ever ask why the publisher takes care to state not only the year but sometimes also the month of the book's first appearance? The usual method of beginning the study of a textbook is to plunge into the first chapter. The title-page is regarded as ornamental or merely for purposes of identification.

But surely the rapid accumulation of knowledge has some effect upon what had been previously collected. Old viewpoints must undergo change in the light of new discoveries and better founded conclusions. One of the first things to note in reading any book is the date of its appearance, for

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many of the references have significance only in their time relation. Similar attention should be given to the date of the editions if there is more than one. After a textbook has been used for a number of terms new material and important revisions may require a very different sort of book, which often is a late edition of a text already adopted. The latest edition becomes, as a rule, more valuable than the earlier ones. The reprintings (which are often made without change) and the revised editions are dated on a page close to the title-page. At times the first reprint may include several changes found immediately necessary.

It is not implied in the foregoing that pupils in the grades and high school will study better because they note the dates of publication. What is intended is that in the school certain habits of reading and study must be formed for accurate and wise studying when school days are over.

The title of the book. Again it may seem a trifle to stress something that really does not seem to concern the contents of the text. It may be trivial but it is a mark of careful and respectful study to know exactly the title of the book one fellows with for several weeks. We certainly would not associate with a person very long without knowing his name. It is hardly the proper thing to refer to him as My friend in Red, or Green; that big thick fellow who is my chum. Proper names may be more individual than *A Textbook in Physics* or *Practical English*, but the title of a book does give it a certain individuality. Besides this, there are many books in red and many that are large and thick, and these general attributes do not identify a specific book. The title defines the field of knowledge considered in the text. ***The careful student will know the title of the book he is studying.***

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Introductory to the reading and study of any book should be a careful reading of the title-page. Its titles and subtitles should be understood by the pupil, and a discussion of their meaning might well form part of the preliminary lesson of appreciation in the subject.

Table of Contents and Index. The *Table of Contents* gives a survey of the whole book. This survey may be meager and general or elaborately furnished in the form of a syllabus. A reading of it will prepare the way for the more complex organization of the book. If the teacher would spend the first hour in talking about the contents of the book soon to be studied, while the pupils had their books open and followed the teacher's talk from point to point, this would prove a profitable method of constructing a background.

The *Index* serves the purpose of ready reference for all the material bearing on a particular topic. Skill in finding such references and ability to use synonyms for related material is certainly a part of the training expected of educated persons. If the pupil owns his book so that he can use inserted leaves containing summaries of parallel reading and notes on the teacher's exposition, it would be good exercise to have him make an index of those inserted pages. This would serve as a sort of review. Making indices of poem, prose, or classics might form a standing assignment during the study of the particular piece of literature.

Another and by no means insignificant value of the index for study purposes is the saving of time resulting from the skillful use of it. Pupils waste much time in trying to find topics and references by turning over many pages until they find what they seek. The index points the way immediately. Forming

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the habit of consulting this guide is essential to all readers. Drill in the use of the index should form part of a preview and review.

The arrangement of material. Another helpful preliminary survey is that concerned with the arrangement of material in a chapter. Different kinds of type are used; there are paragraph or marginal headings; there are italicized passages, illustrations, maps, diagrams, — all of which are so many devices to make the subject more readily understood. The comparison of the Table of Contents and the chapter organization will form a helpful preview, and greatly aid the pupil in sensing that the author has employed an organization that seeks to evaluate knowledge, and to stress certain portions of it especially needful for a complete understanding of the whole subject.

In some books the pupil will notice that the author makes a helpful differentiation between what is of primary importance and what is less fundamental by having the latter appear in smaller type than the former. Doubtless considerable material in history could be treated in this manner to the great advantage of the pupil.

The author's style is another important consideration. While this feature of the book may not be consciously appreciated by the pupil, he certainly knows when a textbook is interesting. It would be of value to call his attention to the author's method in making it appear interesting. Any subject can be organized and discussed in a dull fashion; and it is also true that many subjects, at first glance far removed from the possibilities of interesting presentation, can be made most attractive by a spirited style. The textbook at present is not regarded as fine literature, but there is no good reason

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for its continuing to be a prosy, repellent account of a most fascinating experience of the race.

Thorndike[1] refers to another factor in the arrangement of the material. Attention has already been called to the importance of the textbook as a source of facts; as an organization of these with many interrelationships; and as a basis for arousing the pupil's will to augment the store of knowledge. The arrangement of material must also make it possible for the pupil to master the material in hand without undue difficulty. The material is not to be memorized; it is to be understood. Thorndike says:

Books could be written giving data, directions for experiments and problems with the data and questions about the inferences. The student could be instructed to read each helping piece of information, suggestive question and the like only after he had spent a certain time in trying to do for himself what he was directed to do. Such books might be more effective than all but the best tenth of personal teaching; if the students would faithfully try as directed before reading ahead for helps given. But they will usually greedily use up all the helps first. If by a miracle of mechanical ingenuity a book could be so arranged that only to him who had done what was directed on page one would page two become visible, and so on, much that now requires personal instruction could be managed by print. Books to be given out in loose sheets, a page or so at a time, and books arranged so that the student only suffers if he misuses them should be worked out in many subjects. Even under the limitation of the natural tendency of children to get results in the easiest way, a textbook can do much more than be on the one hand a mere statement of the results of reasoning such as an ordinary geography or German grammar is, or on the other hand a mere statement of problems such as the ordinary arithmetic or German reader is.

[1] *Education*, pp. 164, 5. Macmillan, 1912.

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If a simple, inexpensive, loose-leaf binding could be invented, this might prove valuable in making the textbook adequate for independent studying. But in the lack of some ingenious mechanical device the teacher can employ supplementary reading and group assignments to insure the exercise of initiative. The topical assignment lends itself to this sort of independent studying perhaps better than any other.

Summary. Because the textbook records a considerable portion of the vast wealth of knowledge that men and women have struggled to amass throughout the centuries, it is part of the educative process to quicken respect and even admiration for this precious heritage of the race. Each text, however, does not speak the final word. Its date of publication and the number of editions with their dates show how much the contents of the book are abreast of the most recent additions to the field of knowledge presented in the book. The title of the book, it goes without saying, is equally important. It differentiates the book from others, or identifies it in a logical and intelligent manner. The table of contents gives a preview and a bird's-eye view of the structure of the book, while the index saves time and can be made an interesting means of review work. The arrangement of material, together with an attractive style, is all-important in making the pupil's introduction to a field of knowledge stimulating and satisfying.

QUESTIONS AND PROBLEMS

1. Why was learning confined to only the few in ancient times? Has this attitude entirely changed?
2. How has man evolved systems of knowledge?
3. What is the significance of the various subjects in the light of the evolution of knowledge?

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4. What attitude toward the various subjects should be developed in the pupil?

5. What are the functions of the textbook as a record of human thinking?

6. How are the books misused according to Rousseau and Locke? Does reading imply studying?

7. Why are dates of publication important? Have you ever given questions on them in examinations?

8. How would you train pupils to use the table of contents and the index?

9. Have you studied the arrangement of the textbook with your pupils? What advantages might be expected from such a study on their part?

10. Do you think Thorndike's suggestion regarding the arrangement of textbooks feasible?

REFERENCES

BAGLEY, W. C. *Educational Values.* Macmillan; 1913.

BOYER, C. C. *Modern Methods for Teachers.* Lippincott; 1908; Ch. 3.

DE GARMO, C. *Principles of Secondary Education.* Vol. I. Macmillan; 1913.

JOHNSTON AND OTHERS. *High School Education.* Scribner; 1912.

KARPINSKI, L. C. "Teaching of Elementary Mathematics." School and Society, Vol. 5: 78–86; Jan. 20, 1917.

KELLAR, A. G. *Societal Evolution.* Macmillan; 1915.

MILLER, G. A. "Historical Notes in Text-books on Secondary Mathematics." School Science and Mathematics, Vol. 15: 806–9; Dec., 1915. "History and Use of Mathematics Textbooks." School and Society, Vol. 4: 918–24; Dec. 16, 1916.

MILLER, W. L. "Chemical Philosophy of the High School Textbooks." Science, Vol. 34: 257–63; Sept. 1, 1911.

SLEIGHT, W. G. *Educational Values and Methods.* Oxford; 1915.

STRONG, E. A. "Elementary Textbooks in Chemistry." Science, Vol. 34: 408, 9; Sept. 29, 1911.

THORNDIKE, E. L. *Education.* Macmillan; 1912, pp. 164–7.

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CHAPTER VIII

THE TEXTBOOK AS A MEANS OF INTERPRETING TRUTH

The Observation Point of Knowledge. In the preceding chapter the statement was made that the textbook is really an account of how men have sought to adjust themselves to certain conditions in their environment. Now in this way, and now in that, man has tried to understand some of the mysteries that even to-day confront him on every hand. He has answered many questions. He has solved many problems. But new light breaks upon his knowledge every day, so that he finds his facts and ideas in a perpetual state of flux. To-day's conclusions may be discarded to-morrow, and new hypotheses may come into the control of investigation and experiment. Doctors differ among themselves; men engaged in a debate are frequently seen to be in common agreement, differing only in their use of terms; each one of us can view at best only a small portion of the vast panorama of life. Much of the disagreement current among the learned is due to the different angles of vision they select in their field of study.

The Necessary Bias of a Textbook. Now, each author of a textbook interprets his field of subject-matter according to certain theories that he has come to accept. He may be right as far as he goes, but his observation is necessarily incomplete. If his theory is not based on demonstrable evidence, his con-

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clusions are likely to be erroneous. In studying a textbook, therefore, it becomes essential to bear in mind that it is one author's interpretation; it is only one view of a large field that must be seen from many sides, and which may be understood better from one angle of vision than from another.

Factors of Interpretation. This fact makes it important to train the pupil to note some of the factors that belong to the textbook as a means of interpreting to the present generation what many minds have found important for their own day.

Knowing the Author and the Publisher. Acquaintanceship with *the author* forms a basis of judging the value of the interpretation followed throughout his book. He may be a free-lance who has no regard for concerted opinion. This need not mean that he is wrong, but it constrains the student to investigate carefully the author's reasons for holding the point of view he does. He may be a conscientious investigator who bases his conclusions on his own and others' research. If his training and preparation have been broad and thorough, the reader is more inclined to accept his statements as safe and constructive for educational purposes. The personal element, then, cannot be disregarded in selecting a textbook or in following its plan of organization.

And yet, all too many readers fail to become informed of the author's record. The publishers sense the importance of the personal element by printing below the author's name on the title-page his official position. This identifies him to some extent. If he is connected with a reputable institution that is known for its scholarship and its wide educational influence, it may safely be assumed that he has some ability for the task he has performed in writing the textbook. It

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does not guarantee, of course, that his product is beyond criticism. He may be the spokesman of a school of theorists whose conclusions are difficult to accept; but if his services have been sought by an institution of learning that is constructive and progressively conservative, it may safely be assumed that he is so connected for very good reasons.

Similar information regarding *the publisher* of the book is important. An old, well-known, and widely respected publishing house will not be likely to publish a book whose point of view is educationally detrimental. There doubtless are publishers who exercise little care in their educational output, but the widely recognized houses accept only those manuscripts that expert readers have sifted and minutely examined. The publisher's name is a stamp of guarantee that the textbook has merit, albeit not always merit sufficiently high to meet the needs of a particular school.

The pupils should be introduced to the author's record. In the grades such personalia may not be of great moment, save as means of training the pupil to form the habit of ascertaining some information about the author's scholarship and reputation. In high school this aspect of study becomes more important. The author's name, training, position, and experience deserve recognition in the beginning of a course of study. Knowledge of the publishing house, place of business, its specialties, its local agents, and its methods of securing textbooks would be interesting facts to the older pupil. Such knowledge is of even more value to the teacher who ought to know the sources of supply in his own field of teaching.

The Preface. The contents of a book are as a rule impersonal. Except in autobiographies and similar books, the author hides behind the subject-matter. But in the preface

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he gives a personal message, and usually informs the reader of the purpose of his book and some of the underlying principles that have controlled him in writing it. Although it appears first, the preface is the last thing in the book that the author writes. In it he acknowledges his indebtedness to the persons who in various ways have helped him in producing it.

But how many readers as a rule even glance at the preface? It is to most of them a mere formality of publication. And because they ignore it the book may be wholly misunderstood or at least not used to the best advantage. The average pupil does not bother with the preface, and as long as the teacher does not refer to it in class or spend any time in reading it aloud or having some pupil read it aloud while the others follow the reading with their books open, only an occasional pupil is going to spend any time on it. This condition prevails in college as well. Some authors wisely include in their preface suggestions for studying the text, but these directions are either not known to exist or are deemed superfluous in most schools. If the teacher finds that the preface contains material important for the pupils to understand opportunity should be given them to study this part of the book. The book begins with the preface and not with the first chapter. It is just as important as stating the aim in an assignment, just as significant as knowing the "why" of any undertaking.

The Introduction. Equally unpopular is the average introduction to a book. The very caption sounds forbidding, so much so, that some authors have abandoned the term and use instead such titles as "Survey of the Book," "The Scope of the Subject," "A Bird's-eye View of the Course," each of

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these titles interpreting the real meaning of the introductory chapter. For in this opening chapter are discussed some of the principles and the general point of view, not merely of a particular book, but more especially of the subject itself. Bearing in mind that the author is an interpreter, he states in his introduction what it is he is about to interpret. It is true that many introductions are too long and too cumbersome. They fail to arouse interest; their material is too condensed and exhaustive. But an introduction that seeks to stimulate interest by showing how the subject is valuable to the pupil, and how its present status has been reached (at least the main trunk lines of approach to its present contents), is worth reading in class under the teacher's supervision. Fascinating is the history of mathematics, and the romantic stories of how the Babylonians, Egyptians, Greeks, and Moors made their contributions to the science of numbers. Reference to such historical facts would introduce this subject pleasantly to the adolescent boy and girl.

The introduction contains the foundation of the course. If its arrangement of material seems to the teacher undesirable, adjustments can be made for teaching purposes. But the pupil should be required to study the introduction, wherever it is of vital importance, with whatever guidance the teacher deems necessary; and much of this guidance will be required.

In this connection it is interesting to find in a Bulletin on the Teaching of Reading issued by the Department of Public Instruction of New Jersey (1914) the following statement:

> A book is divided into parts. There is the cover with its cover design and printing. There are the title-page, the preface, the table of contents, the body of the book, divided into sections or chapters, possibly one appendix or more, and an index. Pupils

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should become familiar with these parts, their uses and location in the book, and should habitually refer to table of contents and index in their use of books.

Pupils in the grammar grades should also understand the meaning of the term "copyright."

The intelligent use of books will not become habitual by an occasional lesson. Beginning with the second grade, whenever a book is used at all, it should be used intelligently — not only the reading book, but the history, geography, arithmetic book. Whenever a new book is taken up it should be first examined to discover its author and its purpose (preface), its divisions and their contents.

Book Reviews. In the intricate organization of disseminating knowledge through books there is a class of workers who earn a somewhat precarious means of livelihood by reading books and writing brief summaries of their reading, either critically or wholly commercially. The latter form of reviewing has little value in this connection. But the review that has been carefully composed by an expert, who knows the subject, is well informed of the various theories of interpretation and in the technic of textbook writing, is well-nigh indispensable to the teacher who desires a guide in estimating an author's work. The made-to-order review is uncritical, *i.e.* it is likely to judge the book from only one point of view. But the critical review judges the book on the basis of both defects and merits and is constructive rather than destructive.

An interesting means of training pupils to judge books would be the collection of book reviews and the reporting of them to class. Discussion would follow, and the pupil's criticism of the book would be formed in the light of the reviews, either agreeing with the reviewer or differing from him with reasons clearly stated and supported by reference to the book itself.

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Forming the habit of critical study aids the individual to depend upon himself with considerable security. It probably is true that the average man of our day thinks much more deeply and widely than did the average person a century ago. Still it is true that much improvement is needed in independent thinking, in critical judgment of the opinions and schemes of living being advocated in newspapers, on lecture platforms, in pulpits, etc. The pupil, even though he has been encouraged to criticize constructively, may never become a great thinker, but he doubtless will have the attitude of one who does not accept unthinkingly everything he hears and sees. Credulity will be controlled.

In his *Conduct of the Understanding* Locke affirms what all of us doubtless recognize as true. He says:

Those who have read of everything are thought to understand everything too; but it is not always so. Reading furnishes the mind only with materials of knowledge, it is thinking makes what we read ours. We are of the ruminating kind, and it is not enough to cram ourselves with a great load of collections; unless we chew them over, they will not give us strength and nourishment. There are indeed in some writers visible instances of deep thoughts, close and acute reasoning, and ideas well pursued. The light these would give would be of great use if their reader would observe and imitate them; all the rest at best are but particulars fit to be turned into knowledge; but that can be done only by our own meditation and examining the reach, force, and coherence of what is said, and then as far as we apprehend and see the connection of ideas, so far it is ours; without that, it is but so much loose matter floating in our brain. The memory may be stored, but the judgment is little better, and the stock of knowledge not increased by being able to repeat what others have said, or produce the arguments we have formed in them. . . . All that is to be found in

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books is not built upon true foundations, nor always rightly deduced from the principles it is pretended to be built on.

There is reading of textbooks and other books a plenty in our schools, but the ability to discriminate is not sufficiently recognized. It cannot be expected that pupils will exercise judgment in these matters without stimulus and direction from the teacher or others. *The critical attitude develops slowly*, of necessity, for it requires range of knowledge and thoroughgoing study. Beginnings of such discriminate studying must be made early in the pupil's school career if the habit of comparison and judging is to be fixed by the time he leaves the school. And this habit requires attentive repetition in every subject; otherwise by lack of sufficient exercise it may fail to function at all.

The evaluation and adaptation of subject-matter. While the foregoing units of study are important in training the pupil to get the point of view of an author in his book, the textbook performs its greatest service as an interpreter by means of the principles and methods that govern the evaluation of the material for a particular stage of mental development, and its adaptation to the needs of a particular pupil group. An illustration of the importance of this fact is the work of the Extension Department of the University of Wisconsin. In nearly every branch of study offered in its extension and correspondence courses a textbook is being prepared to fit the needs and interest of the men and women in the trades and commercial courses. The textbooks of similar courses in the regular intra-mural courses of the university have been found ill adapted to the extra-mural students. Present-day methods in engineering and commerce in machine-shop practice, drafting, accounting, correspondence, applied chemistry,

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etc., form the controlling principle of evaluation and adaptation. These books, while directly practical, are also soundly scientific expositions of the fundamentals in each course. They are written simply but technically correct. Many colleges and high schools have adopted these texts.

Scales and standards of measuring educational achievements have not yet been perfected. Complete and final scales are perhaps educationally undesirable, if indeed possible, for it is impossible to foresee what types of training will be required by society for the generations that are to come. Scales and standards must be in a constant state of revision and evolution, never finished, but ever adjustable to the needs of new conditions. But these attempts to determine what is sufficient and what is acceptable in public school subjects have effected important changes in the contents of textbooks.

It is not bulk but weight that is needed in educational courses. Such contrasts as Euclidean vs. Modern Geometry indicate that even in the field of mathematics, fixed as this subject has been for centuries, there is a moving away from the traditional and a closer approach to the needs of the present. The practical is interpreted to mean, however, not only what is commercial, but what actually is educational as well. In the light of this broad practical trend in modern education all subject-matter in the schools is being reorganized so that what is valuable may really function in the development of citizenship for to-day, and so reorganized also, that what is merely perfunctory or formally abstract may be either discarded or carefully minimized.

By means of tests and statistical measurements some of the essentials in school subjects have been formulated, both for the elementary and the secondary courses. If we bear

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in mind the historical fact that school subjects are simply racial experiences organized for the purpose of making younger generations acquainted with the heritage of human endeavor, then it is evident that only those experiences which still function toward mental development and social progress deserve first place in the public school. There are many topics, many incidents, and doubtless numerous problems that can well be neglected in the public school courses, but which still occupy considerable space in the textbook. The testament of knowledge has not been properly executed. Our generation of children is not getting its proper share; it is being burdened by responsibilities that prove to be, educationally, liabilities rather than assets.

Reference to several of the subjects will show how unstandardized is the selection of subject-matter.

The Elementary Subjects. *American History.* The following average distribution of subject-matter in seven history textbooks and in the recommendations of the Committee of Eight shows considerable variability.[1]

TABLE VII

	Average Per Cent of Total Space	Amount of Space Recommended by Committee of Eight
Period of exploration and discovery	8.27	12.90
Period of Colonial development	15.95	21.20
Period of Colonial wars	3.67	3.10
Prerevolutionary period	4.11	2.06
The War of the Revolution	9.58	14.40
1783–1812	14.17	8.70
1812–1861	21.01	22.70
The Civil War	10.22	6.10
1865 to Present Time, or Publication Date	14.45	9.30

[1] Sixteenth Year Book, Nat'l Soc. for the Study of Educ., p. 144.

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According to this table the Committee of Eight finds that authors of textbooks minimize exploration and discovery, colonial development, the revolution, 1812–1861, and stress colonial wars, the prerevolutionary period, 1783–1812, the civil war, and events since 1865. There doubtless has been too much emphasis laid on the civil war. Fifty years hence textbooks in American history probably will devote much less space to it, especially as compared with the present World War. Much of the material since 1865 deals with industrial and commercial development and has peculiar significance in the understanding of the present world crisis.

Arithmetic. A study of four textbooks in arithmetic brings to light some rather striking facts.[1] Out of a total of 1023 types of practical problems 721, or 71 per cent, occur in occupational activities. The following table contains the summary of a much more detailed analysis:

TABLE VIII

	Per Cent of Total Number of Type Problems
(1) Agriculture, forestry, and animal husbandry	10.8
(2) Extraction of minerals	0.2
(3) Manufacturing and mechanical industries	18.1
(4) Transportation	9.9
(5) Trade	21.9
(6) Public service (not elsewhere classified)	6.2
(7) Professional service	2.1
(8) Domestic and personal service	0.8
(9) Clerical occupations	0.4

Monroe informs us that only 9.5 per cent of the working population are engaged in " trade ". And yet more type problems are devoted to trade than to any of the other occupa-

[1] Walter S. Monroe, Sixteenth Year Book of Nat'l Soc. for the Study of Educ.

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tions. A significant 33.2 per cent are engaged in "agriculture, forestry, and animal husbandry," but only 10.8 of the problems in four textbooks deal with the needs of this class of occupation. No problems are given for a large number of the specified occupations which make up 55 per cent of the total working population. The professions are seriously neglected, although clergymen, lawyers, judges, and justices, musicians and teachers of music, physicians and surgeons, school-teachers, and trained nurses all together make up 3.2 of all workers. Only 75 problems deal with the work of these professions, and of these 60 stress teaching in the public school; but there are no problems dealing with the ministry, music, medicine, surgery, and nursing.

The obvious answer to these objections is, of course, that the pupils in the elementary school are not vitally interested in these professions, and that the arithmetic problems in these professions are necessarily very few. But in all of them buying and selling, percentage, fractions, and the four fundamentals are frequently used.

Monroe's study shows also that authors of textbooks are far from agreeing on the type problems of arithmetic. He finds that the frequency with which type problems are repeated is not always in accord with the needs of the pupils; some problems are repeated too often and others not often enough. Furthermore, Monroe's preliminary investigation shows that type problems of considerable complexity appear much less frequently than those comparatively simple. The types with the five highest frequencies are:

At $1.75 each, what will 17 books cost?

A man borrowed $250 on January 15, at 6%. How much was the interest on October 15?

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If I borrow $50, at 6%, on February 8 of this year, how much will be due on May 2 of next year?

What change should be received from a five dollar bill in paying a monthly bill for 30 qt. of milk at 8¢ a quart, and 5 jars of cream at 15¢ a jar?

What is the cost of 50 gal. of paint at 66⅔¢ a gallon, and 4½ gal. of varnish at $1.25 a gallon?

The following kind of problem occurred only once:

A milk dealer received in one month 257,395 lb. of milk, for which he paid 1½¢ a pound. The cost of shipping, filtering, pasteurizing, bottling, and factory and office expense amounted to 12¢ per gallon. Milk weighs 8.5 lb. per gallon, and sells at 8¢ per quart. How much did the dealer make or lose on his month's business?

A survey of "The Social and Business Use of Arithmetic," by Professor G. M. Wilson of Iowa State College,[1] deserves careful study. The survey is based on the actual needs of arithmetic as stated by individuals in various callings. Professor Wilson's conclusions throw light on the problem of the evaluation and adaptation of subject-matter in arithmetic.

1. The opinions of business men and of educators that many arithmetical processes consuming much time could be omitted from the course without loss is borne out quite fully by this survey of the social and business use of arithmetic. The facts go further than the opinions and are a safer guide.

2. The problems solved in actual life are brief and simple. They chiefly require the more fundamental and more easily mastered processes.

3. In actual experience few problems of an abstract nature are

[1] Sixteenth Year Book, *op. cit.*

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encountered. The problems are concrete and relate to business situations. They require simple reasoning and a decision as to the processes to be employed.

4. The study justifies careful consideration of the following question. After the development of reasonable speed and accuracy in the fundamentals and the mastery of the simple and more useful arithmetical processes, should the arithmetic work not be centered largely around those problems which furnish the basis for much business information?

5. Another question: May we not hope through the use of large informational problems and situations in the upper grades, to receive a more intelligent application of arithmetic to actual life situations, *i.e.* to secure the use of more arithmetic in the productive work of the kitchen, in intelligent buying, in proper form accounting, in intelligent saving and investing, etc.?

6. Aside from the work implied by the questions raised in 4 and 5 above, it is evident that the necessary work in arithmetic can be mastered in much less time than is now being devoted to it.

A recent investigation by Dr. Holloway of errors in arithmetic made by over a thousand children in the elementary school indicates the relative amount of stress that should be laid by textbook authors and teachers on the various items in two of the four fundamentals. Tables IX and X seem to be self-explanatory.[1]

Spelling. An examination of the several studies which have been made to determine the minimal essentials in spelling suggests that if authors of textbooks for the various grades would use the words of these lists in all of the texts for each

[1] School and Society, Sept. 1, 1917.

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TABLE IX

TABLE SHOWING ORDER OF DIFFICULTY AS DETERMINED BY NUMBER OF ERRORS MADE BY 1,065 CHILDREN IN EACH OF THE ADDITION FACTS

(Most difficult)	No. of Errors		No. of Errors		No. of Errors
9 + 8	95	7 + 3	37	4 + 3	18
9 + 7	90	6 + 4	34	3 + 2	17
9 + 6	82	6 + 5	32	6 + 1	17
8 + 7	69	9 + 9	29	1 + 1	17
8 + 5	68	5 + 3	26	4 + 2	16
8 + 6	66	7 + 2	24	9 + 2	15
7 + 5	56	2 + 1	21	5 + 1	15
9 + 4	51	7 + 7	20	4 + 1	15
7 + 6	50	6 + 6	20	5 + 2	13
9 + 5	49	5 + 4	20	9 + 1	13
7 + 4	48	6 + 3	20	8 + 2	13
9 + 3	43	7 + 1	20	5 + 5	9
8 + 3	41	6 + 2	19	2 + 2	9
8 + 8	37	8 + 1	19	4 + 4	8
8 + 4	37	3 + 1	19	3 + 3	8

grade the problem of spelling would be partly solved. The list given in the appendix is now being tested out in several schools, and so far reports seem to indicate that there will be needed little alteration in the listing of words for each grade.

Language and Grammar. Several studies have been made with the object of ascertaining the nature and frequency of errors in written and oral language work in the elementary school.[1] (1) Superintendent Thompson of Waukegan, Illinois, found that the most frequent errors in the fifth to eighth grades were verbs, omissions, connectives, incomplete sentences, and homonyms. The least frequent were double negatives, adjectives for adverbs, inverted constructions, articles, and redundancy.

(2) Meek found that of the total errors reported from the

[1] Sixteenth Year Book, Nat'l Soc. for the Study of Educ.

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eight grades, 40.1 per cent are verb errors, 3.4 per cent are double negatives, mispronunciations cause 20.4 per cent,

TABLE X

TABLE SHOWING ORDER OF DIFFICULTY AS DETERMINED BY NUMBER OF ERRORS MADE BY 1,215 CHILDREN IN EACH OF THE MULTIPLICATION FACTS

(Most difficult)	No. of Errors		No. of Errors		No. of Errors
11 × 11	735	7 × 5	181	6 × 2	50
12 × 11	655	9 × 3	169	5 × 3	46
11 × 10	638	9 × 5	168	11 × 2	46
12 × 10	542	11 × 8	167	1 × 1	41
12 × 8	460	8 × 3	151	9 × 2	39
9 × 7	455	11 × 6	144	10 × 3	38
12 × 7	438	6 × 5	138	7 × 2	38
8 × 7	435	11 × 7	137	5 × 5	34
12 × 12	425	8 × 5	137	4 × 2	32
9 × 8	422	6 × 4	133	10 × 4	31
12 × 9	417	11 × 4	131	10 × 2	31
9 × 6	390	6 × 6	129	11 × 1	31
8 × 8	361	11 × 5	113	4 × 1	31
12 × 6	361	6 × 3	102	3 × 1	28
8 × 6	342	11 × 3	99	5 × 2	26
9 × 4	292	10 × 9	94	3 × 3	25
7 × 6	285	10 × 7	86	9 × 1	22
12 × 5	271	10 × 8	85	3 × 2	21
7 × 7	268	12 × 2	81	7 × 1	21
9 × 9	263	10 × 6	79	6 × 1	21
12 × 4	250	4 × 4	78	12 × 1	20
10 × 10	241	4 × 3	76	5 × 1	20
8 × 4	235	7 × 3	71	2 × 1	20
7 × 4	192	10 × 5	58	2 × 2	18
12 × 3	183	8 × 2	58	8 × 1	18
11 × 9	181	5 × 4	55	10 × 1	12

the misuse of pronouns 17.2 per cent, adverb errors 5.8 per cent, and 12.9 per cent are colloquialisms. Sixty per cent of the errors are due to misuse of verbs and mispronunciations.

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(3) The Kansas City study made by Betz and Marshall shows that of all errors in written composition of the third grade pupils, 55 per cent are in punctuation (capitals 22 per cent), 17 per cent in language, 28 per cent in grammar (verbs 13 per cent).

(4) A comprehensive study of oral errors among 1378 Cincinnati children of the elementary school third to eighth grades inclusive was made by Isabel Sears and Amelia Diebel. Of all the errors 49.9 per cent are wrong verb; 13.5, pronouns; 11.6, negatives; 9.7, redundance; 8.0, mispronunciations; 3.5, prepositions; 3.3, adjectives and adverbs; .2 per cent, ambiguous expressions. There is close agreement here with the Illinois and Boise studies as to the frequency of the verb errors.

(5) Wrong sentence structure occupies the head of a list of errors found by Edgar D. Randolph in the grades of the Speyer School in New York City. In the order of frequency the other errors are due to pronouns, verbs, adjectives for adverbs, connectives (other), prepositions.

(6) Other studies indicate that the frequency of errors in the use of verbs is much higher than other errors, and in some cases higher than all the other errors combined. The evaluation of subject-matter in textbooks dealing with language and grammar in the grades would therefore properly stress this unit of instruction much more strongly than other units. Motivated drill is here all-important.

Textbooks based on the course outlined in University of Missouri [1] would prove effective in removing or preventing the proportion of errors listed in the foregoing studies. Very evidently the books that were used in the grades studied

[1] Education Bulletin No. 9, by W. W. Charters and Edith Miller.

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in the investigation referred to failed to accomplish the most needful development in the handling of everyday English.

High School Subjects. Few published studies have been made of evaluated subject-matter in high school courses. The problem of economy of time is just as acute here as in the elementary school, possibly greater, for there has been a rapid increase in the number of courses, many of which are still inadequately organized. The following studies are pioneers in their respective fields, and indicate the kind of investigation that must be made if high school subjects are to be properly evaluated in the textbooks.

Algebra. It is quite generally assumed in algebra texts that inasmuch as algebra is really simplified arithmetic it is primarily concerned with the four fundamental operations of arithmetic. Monroe[1] suggests that besides addition, subtraction, multiplication, and division, algebra makes special use of the equation. Simple equations are most common to elementary algebra. In these simple equations fractions with numerical denominations are much more frequent than fractional equations with an unknown quantity in the denominators. Practical need, therefore, requires that the first group of fundamental operations of elementary algebra deal with this type of simple equations. Quadratic and simultaneous equations form later groups of study.

Monroe finds upon analysis that the operations used in solving a simple equation are: (1) clearing the equation of fractions, (2) transposing terms, (3) collecting terms, and (4) finding the value of x. Clearing an equation of this group

[1] "An experiment in the Organization and Teaching of First Year Algebra," School Science and Mathematics, Vol. 12, pp. 125–131.

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involves the multiplication of a binomial by an integer, and at times the multiplication of a binomial by a binomial. Collecting terms is simple addition and subtraction. Finding x is a form of division.

Textbook authors emphasize certain operations that they regard fundamental to the understanding of the subject of algebra. These are: removal of parentheses, combining terms, subtraction, evaluation, special products, factoring, exponents, clearing of fractions and fractional equations, quadratic equations, graphing of equations, solution of "practical" formulas and simultaneous equations. Rugg found [1] that in seven tests the majority of errors made by several hundred pupils consisted of wrong use of signs and mistakes in arithmetic. His insistence upon the need of drill in these operations in first year algebra suggests that provision for such drill be provided in textbooks. It is perhaps needless to add that such drill exercises should be adequately motivated both by means of the nature of drill itself, and by the illustration of how important such automatic skill is in the understanding of more advanced work in algebra.

Crathorne has defined the utilities of algebra as fourfold: (1) vocational utility or the direct use of algebra in the vocations, trades, and in reading trade journals; (2) avocational utility or the direct use in the leisure of the ordinary educated man, in his everyday life and reading; (3) potential utility or the indirect use in furnishing a necessary foundation for a profession; and (4) lingual utility or the usefulness in giving exercises in clear-cut English expressions.

The most valuable topic in algebra he believes is the use of

[1] "The Experimental Determination of Standards in First-year Algebra," School Review, Jan., 1916.

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letters for numbers, including the evaluation of formulas, this topic finding place under each of the utilities considered. These are as follows:

Algebraic operations have considerable vocational, avocational, great potential, and much lingual value.

Linear equations have great vocational and potential utilities.

Proportion and variation are valuable in all four fields.

Graphical representation and the function have little lingual value.

Radicals have considerable value potentially.

Quadratics have considerable value potentially.

Exponents have considerable value potentially.

Logarithms are valuable for vocational and potential utilities.

Complex numbers have only considerable potential value.

Texts. An attractive arrangement for drill work on these topics is provided by Collins's *Practical Algebra, First Year Course.* There is an abundance of clear explanations, model solutions, and practice material so that the pupil under the direction of an alert teacher has a maximum opportunity to fix these algebraic habits.

Two texts that aim to establish the pupil in the fundamentals in a manner that cannot fail to excite interest are those by Cajori and Odell (a two-year course), and a one-volume text by Schultze. Throughout the Cajori-Odell text arithmetic and algebra are closely connected. The authors avoid complicated proofs and start with certain definite assumptions of the laws of signs in subtraction and multiplication. Simple fractions and easy radicals are introduced early, but not at the expense of comprehensive drill in the four fundamentals.

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The books abound with illustrations. Problems peculiar to physics have been purposely minimized, for the simple reason that first year pupils should not be expected to handle readily such abstract concepts of mechanics in the first year. But problems from the realm of business are given in great abundance. The graphs are employed both for the visualizing of variables in equations and for determined practical results.

The Schultze text agrees with the former in avoiding applications taken from physics, and for the same reason. Schultze is quite right in his criticism that many texts in algebra " are impressive display of sham applications." There is a large supply of drill exercises in the four fundamentals. The chapter on Linear Equations has a unique arrangement, and forms one of the chief features in a book well supplied with excellent qualities. At the end of the book there are 1021 review exercises, surely a supply adequate for discriminating drill and for individual differences in rate and ability of learning. The Hawkes-Tuby-Touton text is another illustration of careful and simple evaluation.

The emphasis being made by some investigators upon what really constitutes the basis of adequate introduction to good progress in the study of algebra must be considered by authors within this field. The solution of equations as well as of the four fundamentals rightly forms the foundation of an understanding of algebra, and not without thorough drill in such processes, with material skillfully evaluated, can the teacher hope to develop not merely interest in the subject but proficiency in its applications as well.

Geometry. Evaluated subject-matter in geometry has begun to appear in the latest texts. The Euclidean system,

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of course, still forms the framework of all courses in geometry, and as a system of logical reasoning it doubtless has no peer. But perhaps for this very reason it is one of the most difficult subjects in the high school, and the textbook of geometry appears as one of the least interesting. In nearly all of the recent textbooks one finds simple preliminary material for the purpose of making clear to the pupil what are the basic notions of geometry, and to what extent logical proof is absolutely indispensable in building up the structure of geometric truth.

The report of the Committee on Geometry [1] makes the quite obvious point that such preliminary units of instruction are quite insufficient in the matter of time. The pupil, here as in algebra, must be exposed a long time to the tools of his studying. He cannot do good and rapid work until the manipulation of the tools is automatic and unconscious. The report suggests that training in attention, observation, description, experimentation, and informal discussion should begin as early as the fourth grade. Where this is impossible the training in handling of tools should occupy all of the first high school year, demonstrative geometry being postponed to the second year.

A Proposed Course. The textbook writer will be interested in the proposed course as outlined by the Committee.[2]

(1) The course aims to begin in the elementary school and to continue in the high school. In the beginning there must be provision for observation with the cube, cylinder, cone, and sphere as objects. Along with this observational work the pupil should be taught to describe correctly the funda-

[1] School and Society, Jan. 13, 1917, pp. 53–59.

[2] E. R. Breslich, chairman, Ernest B. Lytle, Orion M. Miller.

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mental forms of the plane and space as viewed on models and objects around him. By this means he learns to image these forms correctly. He begins to conceive and systematize space magnitudes. Inspection of the boundary of surfaces leads to the explanation of the simplest geometric figures. Through the study of pyramids and prisms he learns to classify triangles and quadrilaterals and the main positions of lines and planes in space. From the cylinder, cone, and sphere he obtains the circle. An important correlation between observation and drawing should be made. Plane and solid geometry must go hand in hand.

After a study of several models and instruments the following terms should be made known to the pupil: cube, rectangle, square, surface, edge, corner, straight line, point, prism, sphere, circle, center, diameter, radius, distance, right angle, perpendicular, straight angle, oblique angle, right triangle, obtuse triangle, parallel lines and planes, complements and supplements.

The pupil should be taught the meaning of the following symbols: $=$, $>$, $<$, $\perp$, rt. $\angle$, and st. $\angle$.

The formulas that give surface measurement of the square, rectangle, cube, and rectangular prism should be taught as well as the facts that $A+B+C=180°$ for any triangle and $A=B=C=60°$ for the equilateral triangle. This work may be given in the sixth grade or earlier. It represents the first stage of instruction in geometry. The manual use of ruler, compasses, and protractor has a prominent place in these units of instruction.

Following this series of lessons the pupil is trained in the use of such geometric concepts as symmetry, congruence, and similarity.

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Symmetry may be observed almost anywhere, for example, in furniture and decoration. The plane of symmetry is illustrated on various objects, *e.g.* the head. From this the pupil may study symmetry in the plane and in the axis. All of this information is gleaned inductively, for scientific terms obviously can have no real meaning for the pupil at this stage of development. Following this kind of work the fundamental constructions are introduced, those based on symmetry, as the bisection of an angle and the erection of perpendicular lines. Logic is not considered formally as yet, but accuracy in speech and construction is stressed. The symmetry of the isosceles and equilateral triangles, the drawing of the medians, bisectors of angles of a triangle, etc., open for the pupil opportunities to recognize general geometric facts. The pupils, each with a differently shaped triangle, find that the bisectors of the angles of a triangle are concurrent. This introduces the query whether it is possible to "prove" that the concurrence of those lines is a general fact. The symmetric properties of solids (cube, pyramid, etc.) are studied. The symmetry of the circle leads to the problem of locating the center and of constructing regular inscribed and circumscribed polygons.

Following this study of solids as a whole the processes of analysis and synthesis are developed, and this type of studying calls for close observation of form and the applied review of what has already been learned. There will now be actual measurement in and about the school, so that by this means the pupil may obtain figures to be constructed and drawn to scale. Some of the fundamental problems of finding inaccessible distances are solved by this method.

In this work models made of wood, cardboard, or wire are

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used. A cube, a quadrangular prism, and a pyramid, divided into symmetric parts by planes, a sphere with the equator marked, and parallel circles and meridians, right and oblique pyramids, prisms, cones, and cylinders, and the five regular polyhedrons are the principal tools of the course.

If the work has been properly developed and care taken to supervise the pupil step by step, it will be right to expect him to know at this point the following:

Measurement and graphing of line segments;
Measurement of angles;
Relations between the angles of a triangle, interior and exterior;
Relations between adjacent angles, complementary and supplementary;
Relations between the acute angles of a right triangle;
Relations between the angles formed by parallel lines and a transversal;
Problems solved by scale drawings;
The fundamental constructions, and construction of congruent figures;
Properties of chords, tangents, and central angles; of the isosceles and equilateral triangles.

The second stage of this course concludes with the correlation of algebra and arithmetic. Adding, subtracting, and multiplying line-segments; measuring lengths, as perimeters and circles; finding areas and volumes — are means of such correlation. Expressions like $(a+b)^2$, $(a+b)(a-b)$, $(a+b)^3$, are pictured with rectangles and cubes. The formula $S=ba$ is developed for whole numbers, decimal fractions, and fractions. Computation of areas leads to square root. Here

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the pupil is led to see the advantage of approximate arithmetic, as he develops judgment as to the limited accuracy of the magnitudes given and to be computed.

This second stage of geometry may be given in the sixth or seventh grade.

(2) The study of logical geometry is not taken up abruptly, but by intermediary material. Proof of geometric facts must precede demonstration. At first the properties of figures are studied and the results found are stated as theorems. The truth of these theorems is then established by reasoning. The method of proof, however, is always informal. When it has been found that two lines perpendicular to the same line are parallel, the pupil will reason about as follows:

"This must be true. For, if they were *not* parallel they would meet and then we would have two lines from a point outside of a given line perpendicular to the given line, which is impossible!" However, the conventional form of proof, given, to prove, proof, might be used in some instances in which the class can appreciate its value.

Geometry at this stage aims:

1. To establish geometric facts, either by studying the figure, or as a consequence of other known facts.
2. To help the pupil to pass gradually to the logical method of demonstrative geometry.

These topics in the transition units of instruction are:

Congruence of triangles.
Similarity of figures.
The properties of isosceles and equilateral triangles.
The proofs of the fundamental constructions.

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Tangents and regular inscribed and circumscribed polygons. The theorem of Pythagoras.

These topics are considered in the eighth grade or in the first year in the high school. About half the time usually given to mathematics, it is recommended by the Committee, should be devoted to the study of geometry, the remainder being spent on other mathematical subjects.

(3) Logical geometry has now been reached. The pupil has already learned to understand the basic concepts of geometry. He has seen the need of logical proof and its advantages over the experimental method. Now he is given opportunity to choose between the various methods of proof. These methods are considered throughout the course, the aim being to lead the pupil to see that there is usually some definite plan that he may follow. He is not left to chance. Five kinds of proof are emphasized: proof by superposition, used mainly in proving the *fundamental* theorems of a chapter; the method of congruent triangles; the indirect method; the method of analysis; the algebraic method.

The Committee believes that the traditional arrangement of subject-matter into books has no special advantage but rather distinct disadvantages. For this reason they suggest the following topics for brief chapters.

1. Quadrilaterals. Parallelograms, angles formed by parallel lines and a transversal, the trapezoid, the kite.
2. Proportional line segments. Parallel lines cut by transversals, constructions leading to proportional segments, processes which applied to proportions give proportions.
3. Similar polygons and triangles.
4. The theorem of Pythagoras and its generalizations.

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5. The circle. Diameters, chords and arcs, parallel secants, tangent circles.

6. Measurement of angles by arcs of the circle. Inscribed angles, angles formed by secants, tangents, and chords.

7. Proportional line segments in circles.

8. Inequalities. In the preceding chapters various theorems on inequalities have been proved. This chapter is an extension and full treatment of the subject.

9. Loci and concurrent lines. Before this several locus theorems have been proved. This chapter is a summary and extension of the subject. The same is true for the next three topics.

10. Regular polygons inscribed in, and circumscribed about, the circle. Length of the circle.

11. Area of the triangle.

12. Area of the polygon and circle

Trigonometry. Attention is called by the Committee to the fact that most textbooks on geometry now contain the fundamentals of trigonometry, consisting mainly of the definitions of the trigonometric ratios, finding the approximate values of the ratios for given angles, the use of tables of the natural functions, and applications to the solution of the right triangles. This work is given usually together with ratio, proportion, and similar triangles. After this as a rule no further use is made of trigonometry. For this reason the pupil soon forgets this brief study of the topic and it appears practically as a wholly new subject when he later takes it up as a separate course. Trigonometry should be used more frequently in geometry, many of the theorems being well adapted to proof by both methods.

Solid Geometry should not be isolated from plane geometry.

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In the courses outlined the pupil has been trained in space perception. While studying plane geometry he should also become familiar with solid geometry. Many theorems in the latter are related to corresponding theorems in the former. If they are proved in plane geometry, the pupil will have excellent exercise in both two and three dimensional thinking. Solid geometry should include the theorems on diedral angles, perpendicular and parallel planes, theorems on lines and planes in space, some study of the sphere, and circles on the surface of the sphere. This leaves for later study the areas of surfaces, volumes of solids, and polyhedral angles in connection with spherical polygons.

Limits. There should be consideration of incommensurable lines. The notion of the limit as a constant approached by a sequence of numbers should be developed but no topical treatment of limit need be given.

Texts. The foregoing course offers many valuable suggestions and is especially valuable for its plan to introduce the study of geometry early and in a manner that conforms to the stages of the pupil's mental development. Some of the features of this course are noticeable in the more recent texts in geometry. The Ford and Ammerman *Plane and Solid Geometry*[1] introduces trigonometrical ratios in the treatment of plane geometry. This text is distinguished also by many problems and illustrations in applied design. In the section on solid geometry there are unusually striking illustrations. The text on *Plane Geometry* by Palmer and Taylor offers many practical applications. Young and Schwartz's *Plane Geometry*[2] emphasizes the "logical structure" plan and symmetry. Its two-color printing in the figures is a unique feature. In

[1] Macmillan, 1913. [2] Henry Holt & Co.

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the *Plane Geometry* by Betz and Webb there is a long preliminary course preceding the demonstrational geometry. Robbins's *New Plane Geometry*[1] follows the traditional organization with strong emphasis on demonstrational methods. *Constructive Geometry* by E. R. Hedrick[2] is a rather unusual geometric notebook, modeled after those long used in England. The provision for many blank pages enables the pupil to make his drawings and to work his problems in this notebook. From the title of the book one expects to find a large number of practical problems. These are abundant and suggest many ways in which geometry can be coördinated with manual training courses.

General Mathematics. Within the past ten years the interpretation of the various branches of mathematics as really so many phases of a general subject has led many teachers to organize general courses in which algebra, geometry, and trigonometry are presented as aids to one another. Correlations, as we have seen, are common also between practical, everyday problems and between physics, manual training, and engineering. This correlation is not an innovation of twentieth-century teachers. For more than a hundred years such combination treatment has been in vogue in European schools. One may trace this conception of general mathematics back a thousand years and more to the great Arabic mathematician, Mohammed ibsi Irusa al-Khowarizmi (even his name suggests correlations of some sort), who wrote the first systematic treatise on algebra and included the well-known geometrical solutions of the quadratic and the application of algebra to a geometrical problem.

This ancient scheme has been reviewed in several note-

[1] American Book Company, 1915. [2] Macmillan, 1916.

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worthy texts, among which the three volumes by E. R. Breslich are the most pretentious and the best evaluated. A series entitled *Correlated Mathematics for Secondary Schools* by Lang and Breuke [1] is a less effective and hardly an original application of the principles of a general course. Shorts and Elson's *Secondary School Mathematics* [2] introduces demonstrational geometry into the first year's work and acceptably unifies the work of the second year.

S. G. Rich of Amanzintoti Institute, Natal, South Africa, reports an ingenious plan of evaluation and adaptation that has succeeded admirably with his Zulu students. These students come from the eighth grade. They have been taught geometry and algebra in separate courses, not going beyond quadratics and circles. They are given extensive revision courses in arithmetic, designed to train the student to teach this subject. At the Institute a course in general mathematics is given under the name "arithmetic." In connection with the revision of mensuration the principal elementary theorems of plane geometry are used, only those being selected which are most broadening to the student's mathematical ideas. The instructor in mathematics applies the single linear equation as a means of extending the range of arithmetical power. Enough algebra is taught to give facility in such work. Such elementary parts as are of traditional value or merely introductory to work beyond the possible needs of the students are omitted. Rich believes that time spent in learning complex factorizations, "removal of brackets," involution, theory of indices is wasted upon the large number of pupils who do not plan to attend college. Skill in handling the tools of linear equations should be more and more emphasized. He applies

[1] Century Company. [2] D. C. Heath & Co.

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this method successfully to simple interest problems with his senior Zulu normal students. In geometry, theorems and facts are introduced as means to solve actual problems from life, ability to demonstrate that " triangles with three mutually equal angles are similar " is less important than developing ability to utilize Pythagoras' theorem.

Zoölogy. The variety of viewpoint among textbook authors in the field is strikingly shown in the accompanying tables compiled by E. R. Downing. Notice, for example, that the wide variation in the amount of space devoted to habits of animals ranges from 0.6% in Bigelow's *Applied Biology* (1911) to 45.3% in Tenney's *Natural History* (1866). Confining the comparison to texts published recently, Bigelow's 0.6% is one extreme and Daugherty's *Principles of Economic Zoölogy* with 30.7% and Hegner's *Practical Zoölogy* with 26.3% the other extreme.

In discussing the trend in *texts in Zoölogy*, Downing suggests that too much emphasis has been placed on the study of morphology from the evolutionary point of view. The danger here is similar to that throughout the entire field of subject-matter in education; namely, that of devotees exalting each his own subject and claiming exceptional educational value for its contents. The high school teacher of zoölogy, impregnated with university ideals and university conceptions of mental development, simply transfers this more mature study of zoölogy to the high school, where the pupil is not ready for a painstaking morphological analysis. Consequently *many pupils are dropping away*, the enrollment in these courses is decreasing. Doubtless the strong movement toward general science is due to this overemphasis on detail in high school science.

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Criteria for Science Texts. Important criteria for the selection of material in textbooks have been suggested by Twiss.[1] The subject-matter must be:

1. capable of being made simple enough to be clearly comprehended by the pupil;

2. knowledge that will help in the accomplishment of some worthy purpose;

3. frequently associated with the situations in which it is likely to be needed, or some part of them, or something like them, so that it can be recalled when the need for it occurs.

Many textbooks in science, and in other subjects as well, have simply restated what earlier texts contain, and in a style even less attractive in some instances. Science is systematic observation of phenomena in various fields of life. The textbook simply records what others have seen. The pupil must see many of these phenomena and specimens for himself; indeed it is better that he see them first and then read about them and then observe them again under scientific direction.

General Science Texts. An interesting and illuminating study of the *Quantitative Analysis of General Science* by H. A. Webb[2] is based on the examination of ten texts, all of them published since 1905. In these ten texts there were in all 3610 pages of instruction, all tables of contents, introductions, appendices, and indices being excluded. "Every topic to which as much as one page was devoted was entered in a card index, each text being credited with the proper number of pages for each subject. There were in all 84 such topics of minor rank." The accompanying chart indicates the distribution of total pages of major subjects. The greatest amount

[1] *Science Teaching.* Macmillan, 1917, p. 90.

[2] School Science and Mathematics, June, 1917.

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TABLE XI

	Agassiz and Gould's *Principles of Zoology*	Hooker's *Natural History*	Tenny's *Natural History*	Orton's *Compparative Zoology*	Holder's *Elements of Zoology*	Nicholson's *Textbook of Zoology*	Packard's *First Lessons in Zoology*	Colton's *Practical Zoology*	Steele's *Popular Zoology*	Nedham's *Elementary Lessons in Zoology*	Boyer's *Elementary Zoology*	Parker and Haswell's *Manual of Zoology*	Davenport's *Introduction to Zoology*	Jordan and Kellogg's *Animal Life*
No. indicating text	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date	1848	1860	1866	1876	1884	1885	1886	1886	1887	1895	1898	1900	1900	1900
Collecting and preserving	—	—	—	0.4	—	—	0.3	1.6	—	1.7	2.1	—	—	—
History of zoölogy	—	—	—	—	—	—	0.3	—	—	—	—	—	—	—
Biography	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bibliography	—	—	—	0.7	1.1	—	0.6	1.1	—	0.7	3.4	—	3.5	—
Comparative physiology	35.4	2.3	1.2	0.5	3.5	—	8.3	1.1	1.2	7.4	0.4	4.6	3.3	30.2
Sex	—	—	0.4	—	—	—	1.6	—	—	—	—	—	—	3.9
Embryology	11.2	—	3.2	4.3	1.4	0.9	2.5	1.4	1.3	4.0	0.9	3.5	3.3	3.5
Life-history	5.4	17.4	4.7	2.4	3.8	3.5	35.4	8.2	5.8	7.1	—	2.2	5.2	8.7
Habits	—	10.1	45.3	3.4	19.3	4.6	10.6	—	6.7	12.9	—	9.6	35.5	20.9
Economic zoölogy	—	3.5	0.8	—	1.1	—	1.0	—	—	—	—	—	5.0	—
Histology	2.2	—	—	4.0	—	—	1.6	—	0.2	0.5	0.4	0.7	—	—
Geographical distribution	12.4	6.8	5.1	3.0	6.5	10.2	2.0	—	4.2	—	—	—	2.5	11.2
Classification	3.6	4.8	8.2	4.4	6.8	2.7	6.2	—	10.9	1.7	1.8	4.0	12.5	2.6
External morphology	—	41.5	24.7	36.0	43.5	45.8	23.0	36.3	59.1	26.6	19.1	24.8	22.8	4.8
Internal morphology	13.7	5.3	5.4	40.4	10.6	28.2	6.0	47.0	10.8	30.7	23.5	48.2	1.5	2.9
Paleozoölogy	11.6	—	—	—	1.1	0.6	0.1	—	—	—	—	—	0.5	—
Archæology and ethnology	—	—	—	—	1.4	0.4	0.1	—	—	—	—	—	—	—
Evolution	—	—	—	—	—	0.9	0.1	—	—	0.7	—	2.4	—	11.6
Miscellanous zoölogy	5.0	8.0	—	—	—	2.3	—	3.3	—	6.0	—	—	4.2	—
Human physiology	—	—	0.5	—	—	—	0.2	—	—	—	48.5	—	—	—
Plants	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Physical geography and mineralogy	—	—	0.5	—	—	—	—	—	—	—	—	—	—	—
	100.5	99.7	100.0	99.5	100.1	100.1	99.9	100.0	100.2	100.0	100.1	100.0	99.8	100.3

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	Kellogg's *Elementary Zoology*	Jordan, Kellogg, and Heath's *Animal Studies*	Linville and Kelly's *Textbook of Zoology*	Davidson's *Practical Zoology*	Hertick's *A Textbook in Zoology*	Bailey and Coleman's *First Course in Biology*	Galloway's *Elementary Zoology*	Hegner's *Introduction to Zoology*	Davenport's *Elementary Zoology*	Kellogg's *The Animals and Man*	Hunter's *Biology*	Bigelow's *Applied Biology*	Daugherty's *Principles of Economic Zoology*	Hegner's *Practical Zoology*	Kellogg and Doane's *Economic Zoology*
No. indicating text	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Date	1901	1903	1906	1906	1907	1908	1910	1910	1911	1911	1911	1911	1912	1915	1915
Collecting and preserving	—	—	—	2.3	—	0.5	—	—	—	3.3	—	—	—	—	—
History of zoölogy	—	—	3.5	—	1.8	—	—	2.1	2.6	—	—	—	—	0.8	—
Biography	—	—	—	—	—	—	—	—	—	—	—	—	—	1.2	—
Bibliography	0.7	—	—	0.8	—	—	0.5	4.5	2.4	0.6	0.9	0.5	—	1.0	—
Comparative physiology	3.0	9.6	12.3	4.5	14.2	—	15.6	15.0	1.3	13.4	2.7	6.4	5.0	7.5	4.9
Sex	—	—	—	—	0.7	—	—	—	1.6	—	0.8	1.8	—	—	—
Embryology	1.5	0.6	4.4	2.8	—	0.3	4.9	6.9	3.1	1.2	0.9	1.8	1.7	1.2	0.6
Life-history	8.6	5.5	7.0	12.5	6.6	1.5	1.5	13.5	23.0	8.1	1.9	2.7	6.0	1.4	4.5
Habits	11.3	6.0	19.6	16.3	18.6	1.5	17.0	10.5	5.5	12.4	8.3	0.6	30.7	26.3	17.1
Economic zoölogy	4.0	10.4	5.5	20.9	4.0	1.7	4.6	—	6.6	8.9	9.8	3.9	7.7	33.1	43.9
Histology	0.6	—	—	—	—	—	2.0	7.0	0.2	0.9	0.2	1.3	0.5	1.8	—
Geographical distribution	3.5	2.8	4.2	—	6.2	0.5	3.0	—	3.1	1.8	0.8	—	2.0	0.4	—
Classification	4.0	5.6	3.3	1.4	8.2	0.8	10.7	4.2	2.8	4.2	0.9	3.5	4.0	5.0	5.4
External morphology	34.3	10.7	20.0	26.3	20.7	18.7	12.2	11.0	22.4	15.8	7.6	8.0	28.7	14.2	12.8
Internal morphology	23.3	3.7	11.0	5.6	4.2	9.4	10.5	15.0	20.8	4.6	3.5	5.4	8.2	5.4	7.6
Paleozoölogy	—	2.4	4.6	1.7	0.2	0.4	0.2	0.9	1.0	2.4	—	—	—	0.4	0.6
Archæology and ethnology	—	3.4	—	—	3.5	—	0.5	—	—	3.0	—	—	1.0	—	—
Evolution	1.5	12.4	4.5	1.7	7.4	—	3.4	5.7	1.8	—	—	—	2.0	0.2	2.7
Miscellaneous zoölogy	0.4	2.7	—	3.1	2.1	0.8	8.3	4.2	—	0.7	—	1.7	3.0	—	—
Human physiology	—	18.2	—	—	—	27.7	—	—	2.6	18.7	24.9	20.8	—	—	—
Plants	—	—	—	—	—	34.5	2.5	—	—	—	36.2	41.3	—	—	—
Physical geography and mineralogy	—	—	—	—	—	—	2.8	—	—	—	—	—	—	—	—
	96.7	94.0	99.9	99.9	98.4	98.3	100.2	100.5	100.8	100.0	99.4	99.7	100.5	99.9	100.1

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of space is devoted to physics, 1041 pages or 28.9%. Of these pages 206 deal with mechanical energy, 143 with heat, 123 with electricity, 115 with light, 49 with magnetism.

Generous provision has been made for the high school girl, there being 194 pages (or 5.4%) devoted to household arts

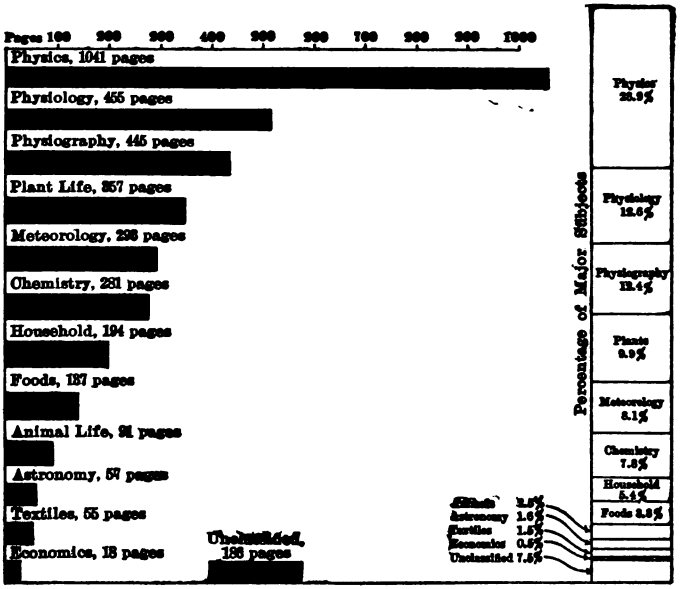

FIGURE IV

and 137 pages (or 3.8%) devoted to food. The large difference in amount of space given to animal life and to plant life may be explained partly by the fact that only 3 pages are devoted to animal reproduction and 40 pages to plant reproduction, a choice of emphasis that has obvious explanation. Only five of the texts treat of astronomy.

The wide range of emphasis by various authors of general

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TABLE XII

Distribution of Subject-Matter in General Science Texts

Name of Text	Hessler	Clark	Coulter	Barber	Elhuff	Snyder	Caldwell–Eikenberry
Total number of pages	458	352	284	584	413	454	302
1. Elem. Mechanics (solids) and Measurement	50 10.9%	32 9.1%	13 4.5%	66 11.3%	42 10.2%	5 1.1%	21 7.0%
2. Water-Chemistry etc., Mechanics of Liquids	30 6.5%	40 11.2%	42 15.0%	50 8.5%	28 6.9%	4 0.9%	33 11.0%
3. Air-Composition, Mechanics of Gases	20 4.4%	22 6.2%	21 7.5%	5 0.9%	40 9.8%	15 3.3%	40 13.2%
4. Heat-Combustion Theory of Heating Systems, etc.	23 5.1%	50 14.2%	44 15.6%	112 19.1%	54 13.2%	13 2.8%	16 5.2%
5. Everyday Chemistry (not under other heads)	40 8.8%	31 9.0%			27 6.5%		
6. Light-Theory and Relation to Life	24 5.0%	49 14.1%	15 5.3%	62 10.8%	21 5.0%	7 1.7%	3 1.0%
7. Sound Theory, and Relations	5 1.1%	39 11.0%			10 2.3%	3 0.6%	
8. Magnetism and Electricity	24 5.1%	46 13.4%			34 8.2%	17 3.8%	
9. Physiology and Food Values	86 18.8%	9 2.6%	10 3.8%	35 6.0%	21 5.0%	15 3.4%	29 9.6%
10. Hygiene and Sanitation	38 8.3%	15 4.0%		80 13.6%	26 6.4%		29 9.6%
11. Weather and Climate	25 5.2%		22 7.1%	125 21.4%		50 11.1%	27 9.0%
12. Physiography and Soils	23 5.1%		47 16.6%	15 2.5%	29 7.1%	234 51.6%	49 16.1%
13. Plants, Elementary Botany, Agriculture	29 6.3%	5 1.3%	27 9.5%	34 5.9%	45 10.7%	45 9.9%	16 5.2%
14. Animals — Elementary Zoölogy	25 5.6%		14 5.0%		22 5.2%	20 4.0%	32 10.8%
15. Astronomy or Star Study			9 3.0%		6 1.6%	25 5.4%	
16. Introductory and Miscellaneous	16 3.8%	14 3.9%	20 7.0%		8 1.8%		7 2.2%

Note. — Owing to the obvious difficulty of analyzing and distributing such assorted material, the above figures do not represent infallible values, but do give an accurate relative idea of emphasis.

In each entry the upper figure is the total number of pages devoted to that topic, the lower the per cent of the total space of the text.

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science texts may be seen in more detail in Table XII. Four of the texts are fairly well agreed on the amount of space given to mechanics (solids) and measurements. There are wide variations among the seven texts in their treatment of heat-combustion, light, sound, physiography. (Snyder spends more than half of his books, 51.6% or 234 pages, on physiography and soils.) Barber, Elhuff, Caldwell, and Eikenberry omit sound and magnetism. Coulter and Snyder fail to discuss hygiene and sanitation (Barber gives 80 pages or 13.6% to illustrate topic); Clark and Elhuff ignore climate and weather, but Barber gives 125 pages (21.4%) to this subject. Only three of the books discuss astronomy, Snyder giving the most space to this subject. Webb's study shows that much attention has been given to illustrations, especially to photographs. In this respect, however, the general science books are not superior to texts in special science, for throughout modern textbook making the artistic and the photographic features are strongly emphasized.

The accompanying Table XII indicates the distribution of emphasis in seven current texts in general science.

History. The accompanying tables indicate that there is wide diversity of judgment regarding the relative importance of material in this subject. An analysis of six recent history texts in medieval and modern history was made for the purpose of showing the apportionment of space to various periods and topics. The period considered is from the Teutonic invasions to the present. The West and the Harding texts treat of the times before Charlemagne only as a summary and review, while the Ashley text stops with the seventeenth century.[1]

[1] Ashley has covered the period since the seventeenth century in his Modern European Civilization.

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The main figures in the tables denote the number of pages in the text devoted to the period or the topic. The smaller figures in each square denote per cents. In all cases the base for percentage is the number of pages in the text dealing with the period in question, 400 to 1917, those pages of the text relating to earlier times not being counted. While great care has been taken to make the estimates accurate the figures are only approximate, owing to the commingling of topics and periods, and the different modes of treatment by the different authors.

The texts studied and compared are as follows:

Harding's New Medieval and Modern History, indicated by H.

Robinson and Beard's Outlines of European History, 2 vols., R & B.

Robinson's Medieval and Modern Times, R.

West's Modern World, W.

Myers's Medieval and Modern History (revised), M.

Ashley's Early European Civilization, A.

A study of the tables reveals some interesting conditions. Four of the texts agree quite closely in the amount of space devoted to the Dark Ages. There is striking uniformity of amount of space given to the Middle Ages, Myers being an exception. But within this period there is wide variation in the treatment of France and in the discussions of the Eastern Empire and of Mohammedan civilization. There is considerable diversity in the amount of space given to the Reformation and the Religious wars. While there is a fairly close agreement regarding the space devoted to modern times, with one exception, there is much variation in the amount of space given to the period preceding 1815. The greatest di-

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versity is noticeable in the discussion on Europe since 1878. In most of the books practically half of the space is used for the medieval period. About one fourth of the space is devoted to the study of the last one hundred years.

TABLE XIII

APPORTIONMENT OF SUBJECT-MATTER IN TEXTS ON MEDIEVAL AND MODERN HISTORY

Text	H	R&B	R	W	M	A
Date of Publication	1913	1912	1914	1915	1903	1915
Pages on period 400–1917	700	900	720	710	700	340
Dark Ages, 400–843	27 4	64 7+	64 9	52 7½	63 9	40 11+
Barbarian Invasions	2 ½	10 1+	10 1½	15 2	14 2	16 4½
Church	1 ⅐	24 2⅔	24 3½	9 1+	18 2½	8 2+
Mohammedans	1 ⅐	11 1+	11 1+	7 1	15 2	4 1+
Eastern Empire	1 ⅐	1 ⅛	1 ⅐		4 ½	
The Franks and Charlemagne	17 2½	15 1½	15 2+	15 2+	10 1½	10 3−
Middle Ages, 843–1300	178 25	175 19½	175 25	180 25	125 18	192 55
Feudalism	14 2	23 2½	23 3½	16 2½	24 3½	6 2−
Medieval Church	18 2½	18 2	18 2½	12 1⅔	7 1	22 7−
Empire and Papacy	29 4	21 2½	21 3	26 3⅔	25 3½	8 2+

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TABLE XIII — *Continued*

Text	H	R&B	R	W	M	A
Date of Publication	1913	1912	1914	1915	1903	1915
Pages on period 400–1917	700	900	720	710	700	340
Middle Ages — *Continued*						
Crusades	26 4–	14 1⅔	14 2	20 3–	27 4–	12 3½
Eastern Empire	1½ ⅙			2 ⅓		
Mohammedan Civilization	3 ½–			2 ⅓	10 1½	
England in Middle Ages	20 3–	21 2½	21 3	40 5½	17 2½	18 5½
France in Middle Ages	14 2	2 ¼–	2 ⅐–	7 1	5 ⅔	4 1+
Medieval Life	24 3½	1	1	15 2		22 7–
The Manor	5 ⅔	3 ⅓	3 ½–			7 2
Towns and Commerce	10 1½	16 1¾	16 2¼	16 2½	18 2½	12 3½
Culture	20 3–	25 2⅔	25 3½	16 2¼	11 1½	18 * 5½
Renaissance Period, 1300–1500	73 12½	43 5–	43 6+	57 8+	63 9	76 22½
Culture and Learning	21 3	26 3–	26 3½	14 2–	41	15 4+
Hundred Years' War	16 2⅓	8 1–	8 1+	8 1+	6 1–	6 2–
Church in 14th and 15th cents.	10 1½			5 ⅔		

* No treatment of architecture except one scant page.

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TABLE XIII — *Continued*

Text	H	R&B	R	W	M	A
Date of Publication	1913	1912	1914	1915	1903	1915
Pages on period 400–1917	700	900	720	710		340
Renaissance Period — *Continued*						
England	9 1½	1 ½	1 ½	1 2		1
France	4 ½+	3 ½	3 ½+	3 +	 1−	1
Germany	4 1−			2 +		
Economic Revolution of Renais.						16 5−
The Reformation and Religious Wars	55 8+	80 9−	80 11+	39 5½	103 15	39 10+
Reformation in Germany and Switzerland	20 3	31 3½	31 4½	12 1⅔	19 2⅔	12 4−
Reformation in England	10 1½	16 2−	16 2½	12 1⅔	28 4	8 2½
Counter Reformation	4 ½+	6 ⅔	6 1−	2 ⅔+	6½ 1−	4 1+
Religious Wars	20 3	20 2½	20 3−	13 2−	13 4⅔	33 4−
Social and Scientific Changes		6 ⅔	6 1−			22 7−
Modern Times, 1648–1917	332 47½	570 63+	380 55	384 55	337 48+	
1648–1815	166 24−	265 29+	195 27	153 22−	215 31	
Age of Louis XIV	18 2½	14 1½+	14 2−	5 ⅔	17 2½	9 3−

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TABLE XIII — *Continued*

Text	H	R&B	R	W	M	A
Date of Publication	1913	1912	1914	1915	1903	1915
Pages on period 400–1917	700	900	720	710	700	340
Modern Times — *Continued*						
England in 17th century	22 3+	21 2½	21 3	35 5	30 4½	4 14+
Rise of Russia and Peter Great	6 1−	5 ½+	6 1−	3 ½−	16 2½	
Germany and Frederick the Great	15 2+	8 1−	8 1+	7 1	11 1½	
Poland	3 ½−	5 ½+	5 ⅔	1 ⅓		
Life and Thought in 18th century		25 3½	30 4+			
England in 18th century	14 2	18 2	18 2½	12 1⅔	17 2½	
French Revolution	41 6−	80 9−	53 7½	52 7½	39 5½	
Napoleonic Era	32 4½	59 6½	37 5½	21 3	44 6½	
Industrial Revolution	16 2⅓	22 2⅓	15 2+	27 4−		
Europe from Vienna to Berlin	76 11	175 19½	100 14	144 20+	75 10−	
Metternich's System and Reaction	10 1½	34 4−	16 2⅓	21 3	8 1+	
France	18 2½		10 1½	23 3+	10 1½	
Austria	6 1−			2 ⅓−	4 ½+	

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TABLE XIII — *Continued*

Text	H	R & B	R	W	M	A
Date of Publication	1913	1912	1914	1915	1903	1915
Pages on period 400–1917	700	900	720	710	700	340
Europe from Vienna to Berlin — *Continued*						
Italy	12 1½	12 1½		10 1½	14 2	
Germany	12 1½	11 1¼		13 2–	13 2–	
Great Britain	18 2½	45 5		40 5⅔	14 2	
Europe since 1878	90 13	130 14½	85 12	87 12½	48 7–	
England	26 3⅔			8 1		
France	1 ⅐			8 1		
Germany	4 ½			15 2		
Russia	9 1½			14 2		
Balkans and Eastern Question	8 1+	6 ⅔		6 1–		
The World in Revolution	28 4					
Science and Social Organization	14 2					
The Far East	11 1½	10 1+		8 1+		

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TABLE XIII — *Continued*

Text	H	R&B	R	W	M	A
Date of Publication	1913	1912	1914	1915	1903	1915
Pages on period 400–1917	700	900	720	710	700	340
Europe since 1878 — *Continued*						
Expansion of Europe in 19th century		40 4½				
Reform in the 20th century				19 2¾		
Medieval and Modern to 1648	370 50	344 38	342 47	336 47	396 56	
1648–1815	167 23	265 29	200 28	130 18	184 26	
1815–1917	200 27	308 33	180 25	246 53	125 18	

The omission of estimates for certain topics in some of the texts does not necessarily mean that the subject is not treated, but that its treatment is so involved with others that it is impossible to make accurate statement of the amount of space devoted to it.

Summary. It has been noted in this chapter that the textbook is a means of interpreting truth. A variety of interpretations is inevitable. Only by a large exchange of opinions resting on carefully secured data can man hope to arrive at results that will benefit the race. The interpretation will have value according to the reputation, training, and experience of the author and those who have coöperated with him. The publishing house that accepts his manuscript sets its seal

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of approval on the author's work and becomes responsible for the general character of his production. It is therefore important to know the professional standing of author and something of the character of the publishing house. Because the author is an interpreter it is necessary to know some of his reasons for taking the stand he does in his book. These reasons are stated in the preface and more fundamentally in the introduction. Both of these should be studied, preferably in an informal reading lesson, the teacher explaining the more obscure terms and meanings. Critical estimate of the author's work is obtainable in expert reviews. These can be used to form the habit of critical reading. Open-mindedness and judicial acceptance of opinion are some of the aims that should be borne in mind when the teacher regards the textbook as an interpreter of truth.

QUESTIONS AND PROBLEMS

1. What is the geographical distribution of the textbook authors of your books? What is the professional occupation of these authors?
2. Why is the preface important?
3. How would you present introductory matter to your pupils?
4. By what means can reviews be used to develop the critical attitude?
5. Why are texts necessarily interpretations of truth?
6. What studies have been made tending toward evaluation of the elementary school subjects? of the high school subjects?
7. Should everything in the textbook be taught? Why?
8. What criteria should determine the selection of subject-matter, in the writing of textbooks? in history, in general science, and in mathematics?
9. What is the chief function of the textbook?

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REFERENCES

DOWNING, E. R. "Zoölogy Textbooks for Secondary Schools." School Review, 1917.

MONROE, W. S. "Arithmetic" in National Society for the Study of Education Year Book, 1917. "An Experiment in the Organization and Teaching of First-Year Algebra." School Science and Mathematics, Vol. 12, 125–131.

Report of Committee on Geometry. School and Society, January 13, 1917; pp. 53–59.

RUGG, H. O. "The Experimental Determination of Standards in First-Year Algebra." School Review, Jan., 1916.

School and Society, Sept. 1, 1917, pp. 265–268.

Sixteenth Year Book National Society for the Study of Education 1917, p. 144.

WEBB, H. A. "Quantitative Analysis of General Science." School Science and Mathematics, June, 1917.

WILSON, G. M. "Arithmetic" in National Society for the Study of Education Year Book, 1917.

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CHAPTER IX

THE TEXTBOOK AS AN INCENTIVE OR INSPIRATION

If the pupil has been carefully trained in using the textbook as a tool; if he has found it a conscientious guide to a wider acquaintance with the subject by means of reference reading, correlation, and application; if he has discovered in its contents sources of valuable knowledge, and has learned that much of this knowledge is influenced by individual interpretation, — it may safely be assumed that his conception of the textbook is more fruitful of concentrative study than if it is treated in the usual manner as a mere source of memory material. But the textbook has not fulfilled its mission until the pupil has become inspired to want more of the subject it represents. If valuable at all it deserves longer studying, provided, of course, that its subject-matter has definite application to a career.

The general appearance of recent textbooks indicates that authors and publishers are conscious of the function the textbook must perform in arousing interest and effort. Many and excellent illustrations, usually photographs where the subject lends itself to this kind of illustration, drawings by skilled artists, diagrams, color work of various kinds — form the attractive features of the newer books. In books on history and literature the subject-matter in most instances is entertaining and illuminating. The selection and arrangement of type is greatly improved.

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All of us, no doubt, can recall our pride in the attractive school books that filled the school bag suspended on our backs like a soldier's knapsack. We wanted new and clean books. Mother had no rest until she sewed on covers, which, if left to our choice, made the books dazzlingly unique. Solomon in all his glory was not arrayed as one of these. Pride of possession was blended with growing interest in the book because of its mysteries, its illustrations, its fascinating tales. Pupils doubtless have the same emotions to-day. Curiosity is ever a powerful educational force. And the author and publisher who have not forgotten the tastes and fancies of their own youth will let memory lead the way to a properly modified and improved artistry of bookmaking that will serve as a well-sustained incentive and inspiration to study.

But after the author and the publisher have done their part there remains a no less significant task for the teacher to perform. He must fan into flame the sparks of enthusiasm ignited by the textbook. The author and the publisher have begun what the teacher must continue and complete. The textbook will not teach itself; it will form a basis of progressive study that by its very success kindles enthusiasm. But the teacher with personality and sincere devotion must take the best in the textbook and the best in the pupil for the construction of a citizen who will think and labor and create as his ancestors thought and worked and created for their generations.

This attitude on the part of the teacher must not be conceived of as a mere exhortation, a contentless appeal that is soon exhausted because it has nothing to feed upon. Only by means of a careful study of the contents of the textbook and a wider reading along lines of its subject-matter can the

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teacher acquire substance for his enthusiasm. But more than this. There is a certain arrangement of material or organization of the course that lends itself to the proper arousing of interest in a subject. This lesson plan or type of organization may be called The Inspirational Preview.

The Inspirational Preview

The Purpose of the Preview. The purpose of this particular lesson type is apparent from its title. But this general purpose has a threefold line of approach.

Presenting Educational Value of the Course. In the traditional table d'hôte type of education the pupil was expected to study what was set before him and it was not his to reason why, only to do and ever try. But the pupil is entitled to know some of the reasons for his being required or advised to study a particular course. In these days educators are much concerned over the problem of educational values, and many of the details in this educational field are still uncertain, but there are general statements as to the value of the respective subjects that justifiably can be told the pupil. He is entitled to know the cultural and practical advantages of the course he is about to pursue.

This apologetic is simply and briefly set forth in the initial class period of the term's work. It is presented entertainingly, but primarily it is told so clearly and with so strong conviction on the part of the teacher, that the pupil is not left in doubt about the good that he has a right to expect will come to him from a conscientious application of his mental strength to the various topics that, panorama-like, are unreeled in the schoolroom.

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Fostering enthusiasm for the course. The teacher is a salesman of truth. He will either stimulate a desire for the course, or he will leave the pupil indifferent and perhaps hostile. By means of correlations and interesting allusions he will so pleasingly unfold the possibilities ahead that the pupil becomes eager to advance to the treasure chambers that are described. A rapid survey of the book by a study of the table of contents and a description of some of the characters or applications belonging to the subject supplies material for this kind of inspirational preview. Unless the teacher is convinced that the subject is worth while and unless he begins the work in an atmosphere of well-founded enthusiasm he cannot expect the pupil to be aflame with eagerness to follow him in the difficulties that are bound to appear. A listless, hack-driven teacher will spoil the best textbook ever written. A teacher on fire with conviction and enthusiasm will extract from the poorest textbook gems of meaning and treasures of life, that the pupil will be, shall we say, hypnotized into desiring. It certainly is hypnotism in the best sense of the word.

Constructing a background. The artist of stage-scenery knows the importance of painting a back-drop that will give perspective and atmosphere to the drama. A man with a background of experience is not bewildered in the presence of new incidents. And the pupil who has had the privilege of seeing the course in birds'-eye view will attack the details of the subject with more confidence of success. The inspirational preview paints the background, and makes it a composite of the experiences of every member of the class. The teacher paints with the author's materials also, using the textbook as an artist does a charcoal sketch. This background is made even richer by a brief reference to the history of the

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subject. There is hardly a subject in the program of studies whose history cannot hold the pupils spell-bound.

In a previous chapter mention was made of arithmetic. Think of the sciences, and of the languages. Wonderful lessons can be planned on the means by which historical knowledge has reached us, with vases, friezes, obelisks, rocks, and arches as the pages, and strange pictorial writing and peculiar letters as the vehicle of the record itself. Pictures of these early histories abound. The alert teacher who loves the task of teaching will be on the search for illustrative material of this sort.

Summary. The inspirational preview is not a loose emotional exhortation. It is emotion controlled by intellect but not dominated thereby. The emotional element is strong, but it is made effective by well-stated reasons for the studying of the subject with carefully selected points of interest that will develop a taste for the work; and building up a background that will give not only a perspective and atmosphere but a prospect that makes the pupil feel familiar with the topics and terms and meanings that he will study throughout the term.

Method of Teaching. In carrying out the purpose of the lesson of appreciation as outlined in the preceding section the teacher will use the textbook in at least four different ways.

Reviewing of related experience. Not only must the pupil be prepared but the subject must be prepared for the pupil. He has already had some experience in the field of study that lies ahead, but he does not understand how his errands at home, his arguments with playmates, his observations here and there, are related to the work he is now to begin. The

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teacher with knowledge of child, adolescent, and adult psychology will appeal to these informal experiences of the pupil. School and life will be blended into unified conceptions that serve as reviews and new views of many heretofore enjoyable but perhaps less intelligible incidents of living. The textbook is presented as part of this familiar experience, but a part that explains and leads.

Inspirational previews in textbooks. Many authors open their books with material that embraces some of the principles of the inspirational preview. *Select Orations of Cicero* by D'Ooge [1] devotes 87 pages to a study of Cicero and his times. There is material here for coördination with ancient history and with modern civics. The book abounds with illustrations, many of which are taken from the author's own unpublished photographs which he took on the ancient sites. One gets the author's plan of developing enthusiasm in the fact that out of 552 pages only 160 deal with the Latin text. The remainder consist of sidelights, helpful notes, vocabularies, lists of synonyms, etc.

The Black and Davis *Practical Physics* [2] begins the first chapter with a discussion on Why study Physics? There are stimulating paragraphs on Physics — a Science, Divisions of Physics, Units of Measurement, of Area, of Volume, of Weight, of Density, etc. The selection of material (as well as the careful omission of certain heavy subject-matter) and the general style tend to attract the pupil to concentrative study.

It probably is necessary to make a textbook rather formal in treatment, but there are fascinating possibilities in using the colloquial style for such courses. Coulter's *Elementary Science* [3] is really an extended inspirational preview to the

[1] Sanborn & Co., 1912. [2] Macmillan, 1913. [3] Am. Bk. Co., 1917.

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whole field of science. The general style of the book may be seen from the opening paragraphs.

Air, water, soil, heat, light, plants, and animals — these are the principal things that make up what we call nature. You will find that your life is a sort of partnership with nature. To live in it the best way, you need to understand this partnership as well as you can. You need to know how to do your part in it. Life is the most interesting thing in the world. You want to find out all you can about it so that you can make your own life as happy and successful as possible. A good way to go at this business of finding out about life is to study first the things that are necessary to all kinds of life, plants as well as animals, and see how these things work together to make our own lives possible and pleasant. That is what we shall do in this book. We shall study the seven things mentioned in the first sentence. We shall study the conditions that are necessary for our own lives, and this will help us a great deal in finding out how we ought to live.

For thousands of years men have been finding out more and more about the world. Each year new knowledge is added to the old, and this knowledge of nature is called natural science. You have read about cavemen and other ancient people, and you know that the savage men of long ago had a hard struggle for existence. They did not understand how to work in partnership with nature, and so nature seemed more of an enemy than a friend. There was much hunger in those days. Famine, wild beasts, and cold weather — these were enemies against which man hardly knew how to protect himself. He lived "from hand to mouth." Only the strong and hardy survived in those perilous times. But since then men have made hundreds of discoveries about nature. These discoveries have made it possible to live much more safely and comfortably, until to-day even poor people have more comforts than had the kings and queens of old.

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Painstaking care has been taken to produce not only inspiring material but artistic setting for this subject-matter in the McManns and Haaren Series of Readers.[1] The child who reads the Primer and the four other readers is certainly in Joyland. The three-color illustrations harmonize with the page. In the Fourth Reader a careful selection has been made from standard literature that is applicable to child life of the Fourth Grade. The selections are in themselves excellent previews of the delights made possible by ability to read.

The present necessity of making first-year Latin introductory to Cæsar has many quite various disadvantages, among them being the formal and purely academic nature of the course. A first-year course that can make the subject-matter attractive and develop in the pupil a genuine enthusiasm for more Latin is not altogether impossible. *A Year in Latin* by W. A. Montgomery[2] has certain unique features. While preparation to read Cæsar is the primary aim of the book, the author has attempted also to give the pupil some idea of the mythology, history, and customs of the Romans. There is a section devoted to Connected Readings from Cæsar, with pertinent leadings and discriminating helps. The author gives a list of Latin Phrases Current in English, such as business terms, crests, coats of arms, etc., humorous phrases, legal phrases, medical terms, school and college, religious terms, miscellaneous phrases, current proverbs, mottoes of sales and of states. Another unusual feature is the inclusion of four songs with musical notation; namely, Gaudeamus Igitur, Dulce Domum (2), and a Latin play song.

Thomas and Howe in their *Composition and Rhetoric* devote ten and a half pages to a carefully selected list of Viola-

[1] Scribner, 1917. [2] Row, Peterson and Company.

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tions of Good Use. They give also a practical treatment on Methods for increasing One's Vocabulary. Pupils who are directed in the reading of Canby and Opdyke's [1] grammatical review in their *Elements of Composition* will feel that here the practical benefits of studying English are well presented. The threefold division of this book into the Means of Composition, the Ends of Composition, and the Aids to Composition is a happy organization through which much that is inspiring toward zealous study is possible. In the Thomas and Howe text there are quotations from several themes written by high school pupils. Their general superiority must act as an incentive to the pupil.

Energetic first impression. The initial command of the term's work is a vigorous "Attention." The teacher is ready, the material is ready. There is to be no uncertainty about the start, no confused running about mentally, but a positive, clear call to work. The first start is not like a gentle trickling of a stream, but rather like the sudden bursting forth of a fountain and geyser. The first impression will capture or the hunt for the pupil's interest will be long and perhaps unsuccessful. This implies that the teacher will know the textbook and the plan of procedure the first day. Many hours will have been spent in getting ready for this first attack.

Outlining the term's work. Some teachers find it advantageous to make a schedule of the days on which the various topics will be studied. Such a calendar may not be followed exactly, but it impresses the pupil with the scope of the course, the systematic development of it, and may prevent unnecessary absences. The outline, furthermore, makes it possible to give proper emphasis to carefully selected topics. Some of

[1] Macmillan.

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these topics may be referred to in the beginning of the term as deserving special study, with the promise that, when the class is ready for them, some very interesting and valuable facts will come to light. Such outlines are now usually required of teacher candidates in schools of education. Ability to organize the term's work a long time ahead and to see it in proper perspective will enable the teacher to find illustrations and practical applications, without which teaching in any subject must proceed with considerable monotony.

Summary. The Inspirational Preview seeks to awaken the pupil's interest in the course as a whole. It is not concerned with any one topic in the course, although its place in the beginning of a new topic has obvious advantages. It solicits the pupil's willingness and effort by giving him a large and interesting preview or panorama, so well organized and so skillfully presented that every pupil enrolled in the subject will feel eager to coöperate to make the class work smooth and successful. Such a start will prevent many of the hardships that teachers encounter in presenting an unpopular subject. The inspirational preview may be called an appetizer. It makes the pupil hungry for the rich meal that will soon be spread before him.

GENERAL SUMMARY

A hasty glance over the field that has been developed in this volume can hardly fail to impress the student of this subject that a very thoroughgoing investigation needs to be made into the administrative and instructional phases of the textbook problem. To a considerable degree this is an American school problem more than a European one.

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Nowhere else have textbooks reached the high development that they possess in this country. So large is the demand for school books and so complex is the problem of supplying them that many questions of publication and distribution have arisen. It is very evident that without the farsightedness and the business acumen of the many publishing houses the improvement of textbooks would have been impossible. The textbook publisher is essentially an educator. He feels the pulse of the educational world. He is quick to grasp the best of the new and to make it part of the books for the coming generation. Instead of fewer books, we need many more of the most highly developed examples of scientific and artistic bookmaking.

In the hands of the skillful teacher the textbook is a wonderful tool whose mastery will make independent studying effective and fascinating. It is also a miniature exhibit of world thinking. Like a Baedeker it guides and directs. To the careful student it interprets what man has thought and wrought; and as the learner grasps some of its meanings he is inspired to delve into the mysteries of intellectual treasures for the glory of life.

Illustrations of Directions in Books and in Class Procedure. An example of how the various suggestions in the chapters on textbook usage may be applied is furnished by Lewis and Hosic in their *Practical English for High Schools.* They begin by calling the pupil's attention to the following points:

THE USE OF THIS TEXTBOOK

Spend one study period in examining this book. Discover the following:

1. The purpose it is meant to serve.

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2. The manner in which it is intended to be used.
3. What parts of it are most interesting.
4. In what ways it will be useful to you.
5. Who wrote it, and when and by whom it was published.
6. How the index is arranged.
7. Whether there are other features of the book worth considering. Be prepared to discuss with your classmates the points outlined above. In discussion try to be clear and courteous.

First of all, learn how to study.

Then follow several paragraphs on the value of the course, how to learn, and similar material.

When authors keep in mind the important fact that the textbook is a tool, a source of knowledge, an interpretation of truth, a guide to supplementary and reference reading, and also a vehicle of inspiration, the arrangement of material and the introduction of directive suggestions will be found in more abundance than is now common even in the most recent texts. Many of the books would become much more effective if they contained less subject-matter and more directions for the mastery of the course. If these directions are copious in the beginning of a topic and gradually decrease in number as the pupil grasps the meaning of each unit in the course there will be little danger of oversupplying him with needful helps.

The following description of classroom technic is taken from *Supervised Study in American History*[1] and illustrates how the author, Miss Mabel Simpson, applied some of the suggestions regarding the use of the textbook.

[1] Macmillan, 1918.

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Definite Instruction in "How to Study"

The Proper Use of the Textbook

I. The Problem for consideration, or What must be understood: What people were the first among the early leaders of civilization, and why?

It is well at the beginning of the term to state the problem for the pupils. Then impress it upon their attention by frequently having it restated. In this way, they will acquire the habit of having a definite thing in mind when they take up their books, and, from the beginning, can be taught to consider and collect only such data as have a definite bearing upon the problem to be solved.

This problem should be written upon the board. Then ask the pupils how they are to find any information which will help them to understand this topic. This will result in their realizing their need for the textbook.

II. Instruction in "How to Study." How to use the Textbook. (Teacher working with the class.)

Directions. Given by the teacher:

1. How many things can you tell me about this book after reading what is printed on the outside only?

The Title Page. 2. Turn to the first page containing printing. Read it; compare it with the words on the outside of the book and tell me what you find on this page which you did not find on the outside cover.

3. What is this page called and why?

(If no one knows, tell the class and write name on the board.)

The Preface. 4. Read the preface and be ready to tell why a book needs a preface.

(Allow sufficient time for each to read. Then discuss the meaning of the word and why the authors placed this brief state-

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ment at the beginning of their book; also its value to us as readers. Encourage the pupils to ask questions about it.)

The Contents. 5. Why does a book have a table of contents, and why is it placed in the front of the book?

6. How many chapters does this book contain?

7. In what way does the "Contents" help a reader?

8. Read the titles of the chapters and select the one you think may give us any information about the first people to be the leaders of civilization.

Chapter I. 1. Glance at the first page of this chapter, and without reading it, tell me what you notice about this page. (Different types of print. Explain the reason for using these different types, if the pupils cannot.)

2. How many paragraphs do you find on the heading "America — The New Part"? — (Three.)

3. Select the proper names on this page which might be difficult for you to pronounce. — (Martin Waldseemüller, Americus Vespucius.)

4. Find the end of the chapter, and see if you can obtain any help. — (P. 18, "Pronouncing List.") (Explain to the class that some books have this list at the end of the book rather than after each chapter. Also tell them how to find the proper pronunciation, if the book has no list.)

5. On page 2, why are two sentences written in different type? Give term for this. — (Italics.)

6. Quickly read the three paragraphs under the first topic, and decide whether they are of value to us in collecting information concerning our problem.

(Obtain the opinion of the class by asking how many think it is valuable, and how many do not. If the majority of the class have made the right decision, call upon a pupil who is incorrect or uncertain, to give his reason; then help him to see why he is wrong. Write a brief statement of the important fact, if any, on the board under the statement of the problem. At every step of the lesson,

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encourage the pupils to ask questions. It is the best proof we can have of definite, purposive thinking.)

7. In the same way, read the next two paragraphs.

8. Consult the small map on next page for location of Nile and Euphrates rivers, — Egypt and Chaldea. Then locate these places with relation to America, on a wall map of the world.

9. Before reading about the Egyptians, question the class to aid them in determining what important facts should be looked for. Some such brief outline should be written on the board before beginning to read:

The Egyptians.	Who they were.
	Where they lived.
	What they did.

10. Under the topic Egyptians, decide how many paragraphs or pages are devoted to the subject. (Pp. 4–8.)

11. When should we make a careful study of the illustrations a book contains?

12. Read silently all information given about the Egyptians. Then make a list of the great things they accomplished. (Allow sufficient time for this. Work with any who seem to have difficulty.)

When this has been done, the lesson should be concluded at this point. Do not attempt to determine how well they have mastered the facts contained in the subject-matter studied. This will be done in the review on the following day. Our chief purpose at this time is to attempt to create a liking for history, by giving the class a glimpse of how to study it.

Since this is the first lesson where a textbook is used, it seems more advisable for the teacher to work with the class as a whole. The suggestions contained in the above lesson have, therefore, been planned for the entire class.

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QUESTIONS AND PROBLEMS

1. Do you find that the authors of your textbooks employ any means of arousing interest in the subjects? What are these means?
2. What are the functions of the inspirational preview?
3. How would you teach by the inspirational preview method? Should lessons of this type be employed frequently? When are they of special importance?
4. What are some of the difficulties in the way of organizing the term's work a long time in advance?
5. What are some of the benefits that might result from the teacher organizing a Lesson Plan Book?
6. What do you consider to be your greatest duty and privilege as a teacher?

REFERENCES

HAYWARD, F. *The Lesson in Appreciation.* Macmillan; 1915.
SIMPSON, MABEL. *Supervised Study in American History.* Macmillan; 1918.

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APPENDIX

THE following lists of words have been compiled by Professor Hugh Clark Preyer of the University of Colorado. They are being used in several of the western schools. The selection seems to the writer so valuable that it is given here as one of the latest and best guides to writers of Spelling books.

A MINIMAL SPELLING LIST, ARRANGED BY GRADES

The words indicated by asterisk are the 169 found in Ayres's *Measuring Scale for Ability in Spelling*, but in fewer than 6 of our 12 lists.

Second Grade

(*343 words*)

add	ate	begin	boy
after	August	*begun	bread
ago	aunt	belong	brick
air	away	best	bright
alone	bad	better	bring
also	ball	bill	brother
am	*band	bird	*brought
among	bank	black	burn
an	basket	block	but
ankle	be	blue	buy
are	been	boat	by
arm	bear	body	call
as	bed	boil	came
ask	before	book	*can
asleep	beg	both	candy
at	*began	box	card

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care
*carry
cart
case
cat
catch
cent
chair
change
chicken
church
*claim
clerk
coat
cold
comb
come
copy
cost
could
count
*cover
cow
cross
cup
cut
dark
dead
dear
December
deep
did
dirt
do
doctor
*does
dog
dollar
done
don't
door
down
draw
dress
drink
drop
*drown
drowned
dust
each
ear
early
east
*eight
even
*evening
ever
every
eye
face
fair
fall
far
fast
father
feed
feet
fell
fence
few
fill
find
fine
first
*five
fix
flower
fly
foot
for
found
*four
*fourth
fowl
freeze
fresh
from
front
full
game
garden
get
getting
girl
give
go
*God
goes
going
gold
gone
good
got
grass
great
green
ground
grow
guess
had
hair
half
hand
hang
*happen
happy
hard
has
hat
have
having
he
head
hear
heard
heart
*held
help
her
here
high
hill
him
himself
his
home
horse
*hot
house
how
hungry
hurt
I
ice
if
ill
in
into
invite
is
it
jump
keep
kind
knew
knife
laid
large
late
lay

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lazy
leaf
leg
lesson
let
letter
long
*lost
make
making
me
meet
men
more
mother
mouse
mouth
my
near
never
new
next
nice
*nine
no
*nor
nose
not
of
off
on
one
only
our
out
own
paper
pencil
pink
push
put
*ran
read
red
road
root
rose
round
run
said
saw
say
*says
school
seed
seven
shall
she
shoe
shut
sick
sister
sit
six
sky
snow
so
soap
*stole
store
story
study
tail
take
teeth
ten
than
thank
that
the
theater
them
then
these
they
this
three
time
to
told
took
top
two
under
up
us
was
wash
water
we
well
went
were
west
what
white
who
will
wind
window
word
would
write
writing
wrote
yes
you
young
your

Third Grade

(*408 words*)

about
above
across
act
addition
afraid
again
*alike
all
alley
allow
almost
along
always
animal
another
answer
any
anything
anyway
appear
apple
April
around
arrest
attend
autumn
avoid
baby
back
banana
barn
bath
beauty
because
become
behind

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beneath
beside
between
big
bite
blossom
board
born
bottom
bought
branch
break
breakfast
breath
bridge
broke
brown
build
built
bundle
bury
busy
butter
button
cake
car
*carried
caught
center
chase
child
children
chimney
choose
*Christmas
circle
city
*cities
clean
climb
close
cloth
*clothing
coarse
color
coming
common
company
control
cook
corner
cotton
cough
*country
cousin
crowd
daily
danger
date
daughter
deserve
die
*died
dinner
dish
divide
double
drive
*driven
duty
earn
earth
*easy
eat
egg
else
empty
end
enough
except
excuse
explain
fail
family
farm
farther
*February
feel
fellow
field
fierce
figure
floor
flour
fond
*forget
fortune
*forty
*Friday
friend
fruit
gave
glad
good-by
grade
grain
grocery
hall
heavy
herself
hoarse
hold
hole
honest
honey
hope
hour
hundred
inch
*inform
inquire
intend
iron
island
*its
jail
June
July
just
kill
kitchen
knee
knock
knot
know
lady
last
laugh
learn
leather
leave
left
lemon
lightning
like
listen
little
live
look
lose
lot
loud
love
low
machine
many
mark
master
measure
meat

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mice
might
mile
milk
mill
minute
miss
mistake
*mister
mistress
Monday
money
month
morning
*motion
move
much
music
must
myself
name
naughty
*nearly
need
news
nickel
night
ninth
noise
noon
north
nothing
notice
now
nut
obey
o'clock
October
often
old
once
open
orange
other
ought
over
pair
parlor
part
party
people
perhaps
pick
picture
pie
piece
place
plain
play
pleasant
point
poor
pound
pretty
*primary
prompt
*prove
quart
quarter
quick
quiet
quite
race
raise
reach
ready
recess
remember
*rest
ribbon
ride
right
ring
room
rough
running
safe
*salt
Saturday
scissors
see
*seen
sell
send
sent
September
severe
shake
*shed
ship
short
should
show
side
sing
sleep
sleigh
small
sold
some
something
*sometimes
soon
sorry
south
speak
spell
spring
stand
star
stay
still
stood
stopped
street
*struck
sugar
suit
summer
sun
Sunday
supper
sure
swim
table
talk
taste
teacher
tell
themselves
there
thing
think
third
thought
thread
threw
through
throw
Thursday
tire
tired
to-day
toward
town
traction
tree
truly
truth
try

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tried
Tuesday
turn
twelve
ugly
uncle
until
upon
use
used
vacation
very
voice
wagon
wait
walk
wall
want
warm
watch
way
wear
week
wet
wheel
when
where
whether
which
while
whisper
whistle
whole
whose
why
winter
wish
with
without
woman
wood
work
worth
wrap
wrapped
written
yard
year
yellow
yesterday
yet

Fourth Grade

(*216 words*)

able
according
account
ache
age
alarm
allowed
angel
attack
author
beginning
believe
biscuit
blanket
breathe
burglar
bushel
cabbage
*camp
canoe
capital
*capture
carriage
chain
*chief
chocolate
circus
civil
class
club
coffee
collar
*contract
corn
cottage
country
dentist
depot
desert
discover
dismiss
ditch
division
dream
engine
enjoy
escape
*examination
expect
failure
fashion
fear
feather
felt
fight
finish
fire
food
form
forward
furnace
furniture
grammar
*grand
guard
guide
gun
hammer
healthy
heat
history
hoping
human
*husband
idea
important
Indian
inside
*itself
justice
kept
king
labor
land
lawn
life
light
line
linen
lonesome
lying
manage
man
March
market
matter
may
*mayor
mean
metal
middle
mind
mine
mischief
most

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mountain
*navy
neighbor
neither
ninety
number
orchard
outside
palace
parade
park
pass
past
pay
peace
period
piano
pigeon
please
pleasure
pledge
pocket
poem
poison
police
post
potato
practice
present
president
pumpkin
quarrel
question
rain
raisin
*rapid
reason
receive
recent
regard
*region
remain
roar
roof
*rule
same
saucer
scholar
second
seem
sentence
separate
set
several
sew
shadow
shore
shoulder
since
sir
skin
slide
smoke
soldier
son
stairs
start
station
stone
stop
straight
strong
such
sweep
taught
teach
term
thick
those
though
thousand
throat
thunder
together
to-morrow
tongue
too
track
train
travel
traveler
trial
trip
trouble
umbrella
unless
village
visit
visitor
waist
war
weather
weigh
win
women
won
wonder
wonderful
world
wreck
wrong

Fifth Grade

(*186 words*)

address
afternoon
against
agreeable
already
although
angry
anxious
army
arrive
article
attention
auto
automobile
awful
bathe
beat
beautiful
*became
bicycle
birth
blow
bruise
business
*cannot
carpet
cause
cement
chance
coast
collect
column
comfort
concern
concert
couple
course
court
cushion
damage
dangerous
*dash
debt
defeat
describe

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destroy
different
direction
disappoint
dispute
*district
doubt
*drill
edge
equator
*especially
everything
exercise
expense
*fact
familiar
famous
favorite
fever
fifth
*final
finger
*firm
*folks
forest
*free
frightened
*gentleman
glass
government
handkerchief
heaven
height
hospital
*immediate
*indeed
*injure
instead
interest
jealous
journey
judge
language
lawyer
length
level
loose
*loss
mail
match
maybe
medicine
merely
modern
narrow
nature
nephew
none
November
object
occupy
ocean
opinion
*organize
*organization
orphan
ourselves
page
passenger
person
persuade
picnic
pin
plant
position
pour
press
price
problem
promise
proper
railroad
rather
real
reply
rise
river
roll
saddle
sail
scratch
sea
secret
section
select
sense
serious
serve
settle
shepherd
sight
sincerely
size
song
square
*stamp
state
steal
stock
strange
succeed
success
*sudden
suggest
supply
suppose
surprise
tear
telegraph
terrible
Thanksgiving
*thus
ticket
to-night
true
union
useful
usual
vegetable
*victim
view
*vote
wake
waste
wave
weak
Wednesday
wide
within
wound
woolen

Sixth Grade

(*155 words*)

absent
accept
acquaintance
advantage
advice
*agreement
altogether
appetite
application
arrival
assist
assistance
*athletic
attempt
avenue

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baggage
balance
breast
brief
cabin
calendar
captain
catalogue
certain
charge
citizen
clear
climate
coal
*condition
contain
decision
*develop
diamond
dictionary
difference
*direct
due
during
*elect
*election
entertain
*entitle
*entrance
*express
extreme
factory
favor
finally
foreign
freight
further
future
general
genuine
glorious
guest
imagine
immediately
importance
impossible
innocent
jewel
least
*local
luncheon
*manner
material
mere
museum
national
necessary
newspaper
note
*obedience
oblige
occasion
odor
office
*omit
order
parentage
particular
partner
patient
pavement
peculiar
physical
pity
plan
plenty
political
possible
power
prefer
principal
principle
print
prison
private
*progress
*property
punish
purpose
pursue
rate
really
receipt
refer
relief
repair
report
request
*respectfully
restaurant
result
return
review
route
scene
scenery
search
season
sheriff
shine
sign
silver
special
spend
spoil
spread
steady
stomach
strength
student
*support
*tax
telephone
temperature
their
thermometer
thin
thorough
*total
trust
unable
understand
*unfortunate
valuable
variety
volume
wander
weight
wife
wire

Seventh Grade

(131 words)

accident
acknowledge
*action
*adopt
advertise
amount
*annual
apply
appoint
appreciate
arrange
arrangement
association
assure
*await
bargain
benefit

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bouquet
campaign
candidate
*career
catarrh
cemetery
century
character
check
college
*colonies
*combination
command
committee
complete
compliment
conduct
*conference
*connection
consider
continue
convenient
*convention
*cordially
criticize
cylinder
deal
death
*debate
decide
*declare
*degree
*delay
desire
*difficulty
disappear
distance
*distribute
education
effect
effort
*elaborate
*emergency
*empire
*enter
*evidence
experience
*flight
gymnasium
honor
illustrate
*increase
information
interrupt
*investigate
invitation
issue
judgment
knowledge
license
manufacture
marriage
mention
minister
moment
mortgage
nuisance
*objection
obtain
offer
opportunity
opposite
perfect
personal
physician
*population
practical
prairie
*preliminary
prepare
preparation
privilege
*publish
recognize
recommend
reference
*refuse
relative
religion
remark
remedy
salary
secretary
service
*session
similar
signature
single
sleeve
society
*soft
sole
splendid
*steamer
subject
sufficient
superintendent
system
tariff
*testimony
therefore
usually
*various
yield

Eighth Grade

(*38 words*)

affair
allege
argument
attendance
camphor
*circular
*circumstance
*convict
corpse
department
*discussion
*employ
*engage
*entire
*estate
*estimate
forenoon
*grant
*improvement
*include
*income
*majority
member
*official
proceed
*provide
*provision
public
*publication
*recover
*responsible
*retire
secure
*senate
*summon
treasure
vacant
*witness

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